FINDING OF NO SIGNIFICANT IMPACT (FONSI)
ENVIRONMENTAL ASSESSMENT OF THE
FARISH RECREATION AREA OBSERVATORY AND CABIN CONSTRUCTION

BACKGROUND

The United States Air Force (USAF) conducted an Environmental Assessment (EA) of the potential environmental and social consequences of implementing proposed Observatory and Cabin Construction projects at the United States Air Force Academy's (USAFA) Farish Recreation Area (Farish), pursuant to the National Environmental Policy Act (NEPA) of 1969 (42 United States Code §4321 to §4370d), Council of Environmental Quality's (CEQ) implementing regulations (40 *Code of Federal Regulations* [CFR] Part 1500-1508), and the Air Force Environmental Impact Analysis Process (EIAP) as promulgated in 32 CFR Part 989 (EIAP, 6 July 1999, as amended by 66 Federal Register 16866, 28 March 2001), which implements NEPA, CEQ regulations, and Department of Defense (DoD) Instruction 4715.9 (Environmental Planning and Analysis).

DESCRIPTION OF THE PROPOSED ACTION

The Proposed Action is USAFA's preferred alternative. The US Air Force proposes to construct new facilities at the Farish Recreation Area (Farish) consisting of an observatory and recreational cabins.

Observatory and Telescope – The proposed observatory and telescope site is located on Cadet Hill, which is north of Leo Lake and east of the southern end of Grace Lake. The Cadet Hill site was chosen because the area is dark and ambient light would not interfere with telescope viewing and allows unobstructed views in all directions. Cadet Hill is also the location of an old landfill; a delineation of the landfill would be conducted prior to the exact siting of the observatory and utility line to ensure construction activities of the facility would not penetrate the cap of the landfill.

This project would consist of a domed enclosed building, approximately 10 feet in diameter and 7 to 9 feet tall, housing a 16-inch diameter Meade Cassegrain telescope. The building foundation would be built on a concrete pier, extending three to four feet into the ground. The facility would include a sunken vibration barrier for the observatory. Security fencing would surround the observatory. In addition, there would be a graveled, unimproved parking area. This area would be approximately 35 feet by 25 feet (900 square feet) and designed for parking of about eight vehicles. The existing road to Cadet Hill would have improved grading and graveling. An electric utility line would be installed from the bottom of Cadet Hill to the proposed observatory site.

Recreational Cabins – The recreational cabins would include the construction of up to eight new cabins at two sites. The new cabins would be similar to the rustic cabins already existing in Farish, and would be approximately 14 feet wide by 26 feet long, with a 4-foot-wide porch. Each cabin would sleep approximately four people and includes a porch swing, cooking grill, and picnic table. Lines providing electricity to the new cabins in Site 2 would tie into existing utilities.

ALTERNATIVES CONSIDERED

In addition to the Proposed Action, a No-Action Alternative (as prescribed by CEQ regulations) and one action alternative was considered and evaluated in the EA.

Under the Action Alternative, identified as Alternative 1, the proposed new observatory and telescope would be located south of National Forest Road NF-309 and east of Wedding Ridge. These facilities would be the same as those described in the Proposed Action; only the site location would change. Site locations for the eight new recreational cabins evaluated under Alternative 1 are the same as described in the Proposed Action.

Report Documentation Page

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Under the No-Action Alternative, the new observatory would not be built and USAFA cadets would not have the opportunity to observe the night sky and make measurements from Farish. In addition, the new recreational cabins would not be built. Without additional lodging facilities at Farish, the number of recreational cabins would continue to be insufficient to meet the number of requests for lodging.

SUMMARY OF ANTICIPATED ENVIRONMENTAL IMPACTS

Consideration of effects described in the EA and a finding that they are not significant is a necessary and critical part of this Finding of No Significant Impact (FONSI) as required by 40 CFR 1508.13. Significance criteria are defined in 40 CFR 1508.27 to consider direct, indirect, cumulative impacts and the context and intensity of impacts. The potential impacts of the Proposed Actions are analyzed in detail in the Affected Environment and Environmental Consequences sections of the EA for the following resource areas and conditions: vegetation, wildlife, geology and soils, land use, visual resources, noise, hazardous materials and waste, and solid waste and pollution prevention. The analyses indicated that implementing the Proposed Actions would have no significant direct, indirect or cumulative effects on the quality of the natural or human environment. Mitigation measures described in the EA and incorporated into the Proposed Actions are generally required by laws, regulations or USAF policies and are adopted by this decision.

PUBLIC REVIEW AND INTERAGENCY COORDINATION

NEPA, CEQ regulations, and the EIAP at 32 CFR Part 989 require public review of the EA before approval of the FONSI and implementation of any Proposed Action. The Draft EA was made available for a 30-day Federal, state, and local agency and public review and comment period through publication of a notice of availability in the September 1, 2011 edition of the *Colorado Springs Gazette*. Copies of the Draft EA and Draft FONSI were distributed to various Federal, state, and local agencies. Hard copies were available at the Penrose Public Library and the Air Force Academy Base Library. The public comment period on the EA closed on October 3, 2011. USAFA did not receive any comments from individuals or agencies on either the Proposed Action (USAFA's preferred alternative) or the Action Alternative (Alternative 1).

FINDING OF NO SIGNIFICANT IMPACT

After review of the Farish Recreation Area Observatory and Cabin Construction EA prepared in accordance with the requirements of the National Environmental Policy Act, the Council on Environmental Quality regulations, and the Environmental Impact Analysis Process (32 Code of Federal Regulations [CFR] 989, as amended), I have determined that implementation of the Preferred Alternative would not have a significant impact on the quality of the human or natural environment. An Environmental Impact Statement will not be prepared. The Preferred Alternative was found to meet the USAFA's purposes and needs. This decision has been made after taking into account all submitted information and considering a full range of practical alternatives that would meet project requirements and are within the legal authority of the USAF.

Thomas L Gibson

THOMAS L. GIBSON, Col, USAF
Commander, 10th Air Base Wing

21 Dec 11

Date

Final

Farish Recreation Area Observatory and Cabin Construction Environmental Assessment (EA)

U.S. Air Force Academy, Colorado

Prepared by: URS Group, Inc.

October 2011

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Cover Sheet
Final Environmental Assessment of the
Farish Recreation Area Observatory and Cabin Construction
U.S. Air Force Academy, Colorado

Responsible Agency: 10th Air Base Wing (10 ABW), U.S. Air Force Academy (USAFA), Colorado

Affected Location: Farish Recreation Area, Colorado

Document Designation: Final Environmental Assessment

Proposed Action: The Proposed Action is also the USAFA's preferred alternative. The U.S. Air Force proposes to construct new facilities at the Farish Recreation Area (Farish) consisting of an observatory and recreational cabins.

Observatory and Telescope – The proposed observatory and telescope site is located on Cadet Hill, which is north of Leo Lake and east of the southern end of Grace Lake. The Cadet Hill site was chosen because the area is dark and ambient light would not interfere with telescope viewing, and because the location allows unobstructed views in all directions. Cadet Hill is also the location of an old landfill, a delineation of the landfill would be conducted prior to the exact siting of the observatory and utility line to ensure construction of the facility would not penetrate the cap of the landfill.

This project would consist of a domed enclosed building, approximately 10 feet in diameter and 7 to 9 feet tall, housing a 16-inch Meade Cassegrain telescope. The building foundation would be built on a concrete pier, extending three to four feet into the ground. The facility would also include a sunken vibration barrier for the observatory. Security fencing would surround the observatory. In addition, there would be a graveled, unimproved parking area. This area would be approximately 35 feet by 25 feet (900 square feet) and would be designed for parking of about eight vehicles. The existing road to Cadet Hill would be improved with grading and graveling. An electric utility line would be installed from the bottom of Cadet Hill to the proposed observatory site.

Recreational Cabins – The recreational cabins would include the construction of up to eight new cabins at two sites. The new cabins would be similar to the rustic cabins already existing in Farish, and would be approximately 14 feet wide by 26 feet long, with a 4-foot-wide porch. Each cabin would sleep approximately four people and would include a porch swing, cooking grill, and picnic table. Lines providing electricity to the new cabins in Site 2 would tie into existing utilities.

Alternative 1: Under the Action Alternative, identified as Alternative 1, the proposed new observatory and telescope would be located south of National Forest road NF-309 and east of Wedding Ridge. These facilities would be the same as those described in the Proposed Action; only the site location would change. There would be no alternative for the recreational cabins – the construction and location of the eight new recreational cabins under Alternative 1 would be the same as described for the Proposed Action.

Other Alternatives Considered: Other alternatives were considered but eliminated from further review. Several different locations were considered for the observatory. Sites located within the USAFA boundaries were considered but there was too much light pollution in the area that would interfere with the telescope's viewing of the night sky. Locations within the USAFA were therefore eliminated from consideration. There was also consideration of an observatory within the Farish Conservation Zone, a currently undeveloped area comprising the southern portion of the Farish Recreation Area. This area has no existing utilities, and the introduction of the facility would present an intrusion into the tranquility of the area. In addition, no existing roads currently lead to this site, so construction of an access road would be necessary. Therefore this location was eliminated from further consideration.

No Action Alternative: Under the No Action Alternative, the new observatory would not be built and USAFA cadets would not have the opportunity to observe the night sky and make measurements, or track the sun from Farish. In addition, the new recreational cabins would not be built. Without additional lodging facilities at Farish, the number of recreational cabins would continue to be insufficient to meet the number of requests for lodging.

Written comments and inquiries regarding this document should be directed to Ms. Jennifer McCorkle, NEPA Program Manager, USAFA 10 CES/CECP; Tel. 719-333-8869; email jennifer.mccorkle.ctr@usafa.af.mil.

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Acronyms

ACM	asbestos-containing materials
AFI	Air Force Instruction
BMP	best management practice
CAA	Clean Air Act
CCR	Code of Colorado Regulations
CDPHE	Colorado Department of Public Health and Environment
CDWR	Colorado Division of Water Resources
CE	Civil Engineering
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CGP	Construction General Permit
dB	decibel
DoD	Department of Defense
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EO	Executive Order
ETL	Engineering Technical Letter
Farish	Farish Recreation Area
HAZMART	Hazardous Materials Pharmacy
Hz	hertz
LBP	lead-based paint
MS4	Municipal Separate Storm Sewer Systems
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969
NFADD	No Further Action Decision Document
NFRAP	No Further Remedial Action Planned
NOI	Notice of Intent
NRHP	National Register of Historic Places
OSHA	Occupational Safety and Health Administration
P2 Program	Pollution Prevention Program
PCB	polychlorinated biphenyl
PEM	Palustrine Emergent

Acronyms

POL	petroleum, oil, & lubricants
Project	Farish Recreation Area Observatory and Cabin Construction Project
PSS	Palustrine Scrub-Shrub
QRP	Qualified Recycling Program
SWMP	Stormwater Management Plan
SWPPP	Stormwater Pollution Prevention Plan
USC	United States Code
USAF	United States Air Force
USAFA	United States Air Force Academy
USEPA	United States Environmental Protection Agency

This chapter describes the purpose of and need for the Proposed Action at the United States Air Force Academy (USAFA) Farish Recreation Area (Farish), provides a summary of the scope of the environmental review and the applicable regulatory requirements, and presents an overview of the organization of the document.

Federal agencies are required to consider the environmental consequences of proposed actions in the decision-making process under the National Environmental Policy Act of 1969 (NEPA) (42 *United States Code* [USC] §4321 to §4370d) and the Council on Environmental Quality's (CEQ's) implementing regulations (40 *Code of Federal Regulations* [CFR] Part 1500-1508). An Environmental Assessment (EA) for the proposed Farish Recreation Area Observatory and Cabin Construction Project (Project) has been prepared in accordance with NEPA. This EA complies with the Air Force Environmental Impact Analysis Process (EIAP) for the Proposed Action as promulgated in 32 CFR Part 989 (EIAP, 6 July 1999, as amended by 66 Federal Register 16866, 28 March 2001), which implements NEPA, CEQ regulations, and Department of Defense (DoD) Instruction 4715.9 (Environmental Planning and Analysis).

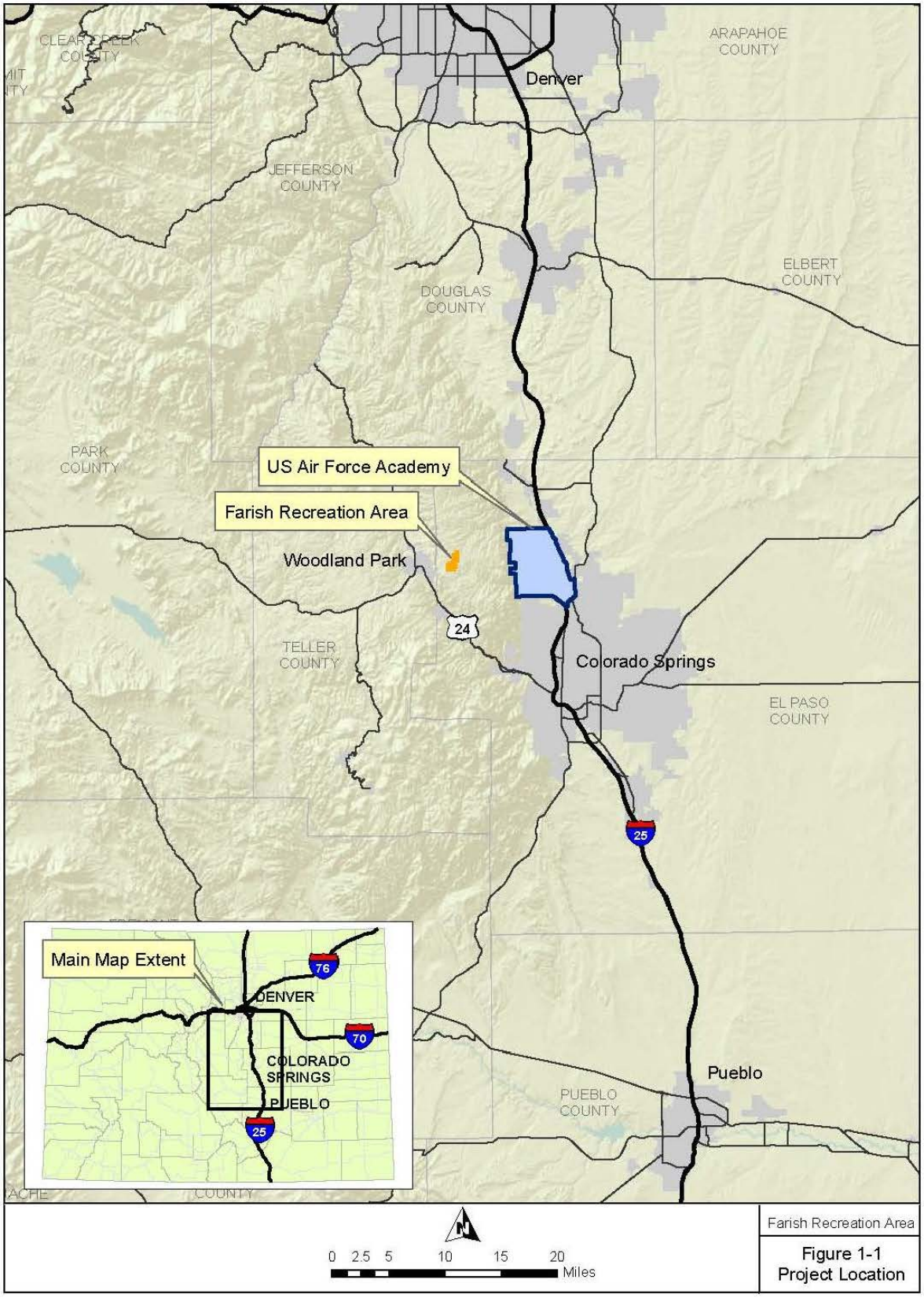
1.1 BACKGROUND

The Farish Recreation Area is a 655-acre site located in the mountains of the Rampart Range in the Pike National Forest, approximately six miles west of the USAFA, at an altitude of 9,000 feet. The Farish Recreation Area location is shown in Figure 1-1. Farish is owned and administered by the USAFA and is open only to active-duty, retired military and their families, and DoD employees.

The Farish Recreation Area is open year-round for lodging and for day use. Campsites are closed in late October and open again in May. Summer activities include hiking, mountain biking, fishing, and camping. Cross-country skiing, sledding, ice skating, ice fishing, and snowshoeing are available during winter. Three lakes in the Farish Recreation Area (Grace, Leo, and Sapphire Lakes), are open for fishing year-round. Lodging facilities include a historic lodge, single-family cottages, modern duplex units, and rustic recreational cabins.

Farish can currently accommodate over 200 visitors at the multiple day-use and lodging facilities located within the recreation area. The Farish Conference Center provides facilities for groups of up to 75, and the main picnic pavilion on Lake Leo can accommodate groups of up to 100. Overnight lodging facilities are also available, including a historic lodge, a cottage, campsites, tent sites, six duplex lodging units at the Conference Center, and the existing rustic cabins.

Cadet Hill was created early in the history of Farish, and is believed to be primarily composed of the material dredged during the excavation of Leo and Grace Lakes. The hill was later used as a landfill for trash generated at Farish. The landfill operated from 1959 to 1960 and again from 1968 to 1971. Following capping and closure of the landfill, testing of water, soil, streambed and lakebed sediment samples near the landfill was conducted as part of the United States Air Force (USAF) Installation Restoration Program. In January 1997, a No Further Action Decision Document (NFADD) was prepared and submitted to the Colorado Department of Public Health and Environment (CDPHE). The document detailed the investigations that had occurred at this site along with a recommendation of No Further Remedial Action Planned (NFRAP). An amendment to the January 1997 NFADD for the Farish Landfill (Site 3) was prepared in November 1998. This amendment and the NFADD were approved by CDPHE in December


CLEAR CREEK COUNTY
ARAPAHOE COUNTY
Denver
JEFFERSON COUNTY
ELBERT COUNTY
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US Air Force Academy
Farish Recreation Area
Woodland Park
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DENVER
70
COLORADO SPRINGS
PUEBLO
25
Pueblo
PUEBLO COUNTY
0 2.5 5 10 15 20
Miles
Farish Recreation Area
Figure 1-1
Project Location

1998. According to the January 1997 USAFA NFADD: Site 3 Farish Landfill, *'No contaminants were detected at Site 3. Site 3 has been determined to present no imminent or substantial threat to human health or the environment'* (USAFA 1997).

1.2 PURPOSE AND NEED FOR THE PROPOSED ACTION

The USAF has prepared this EA to assess the environmental impacts resulting from the proposed Project. The Proposed Action would include the construction and operation of an observatory containing a 16-inch telescope and the construction of eight new recreational cabins at two sites. The new cabins would be similar in size and appearance to the existing rustic recreational cabins in Farish.

1.2.1 Observatory and Telescope

The purpose of constructing the proposed observatory is to provide a facility that would enhance the educational opportunities for USAFA cadets. The observatory would house a 16-inch Meade Cassegrain telescope and allow students in the Space Situational Awareness class to observe the night sky and make measurements. Students could triangulate measurements made at the proposed site with measurements from other sites to calculate better estimates of object locations. Additionally, the building foundation and isolated concrete pier would be designed by students in the Civil Engineering (CE) 491 Foundation Engineering class. Designing the proposed facility would provide these students with real-life experience in geotechnical investigations and in addressing potential environmental issues. Currently, there are no observatory or telescope facilities available at Farish to provide students these opportunities.

1.2.2 Recreational Cabins

The purpose of the proposed recreational cabins is to provide additional lodging facilities at Farish. Currently, the number of recreational cabins is not sufficient to meet the number of requests for lodging.

1.3 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

1.3.1 Resources to be Analyzed in this EA

This document addresses the potential impacts of the Proposed Action to vegetation; wildlife; geology and soils; land use; visual resources; noise; hazardous materials and waste; and solid waste and pollution prevention.

The Draft EA will be made available for public and agency review and comment. The decision to be made, after reviewing the analysis contained in the EA, is whether to issue a Finding of No Significant Impact or to proceed with the development of an Environmental Impact Statement (EIS) to further analyze the potentially significant impacts resulting from implementation of the Proposed Action or Alternative 1.

1.3.2 Resources Eliminated from Detailed Analysis

In compliance with NEPA, CEQ, and USAF regulations and guidelines, this document focuses on those conditions and resource areas that are potentially subject to impacts. Some environmental resources and conditions that are often analyzed in an EA have been eliminated from analysis or review. These resources include social or economic resources, air quality, water resources, wetlands, floodplains, cultural resources, transportation, utilities, threatened and endangered species, and airspace. The following paragraphs identify these resource areas and the basis for such exclusions:

- **Social or Economic Resources, including Environmental Justice –** The Proposed Action would not alter socioeconomic factors such as local economic bases, salary levels, land use zoning, plans or programs of other agencies, or a particular socioeconomic group. Since Farish is a destination location only for active-duty, retired military and their families, and DoD employees, the customer base for the local lodging in the surrounding areas would not be impacted. Although the Proposed Action would increase short-term employment, no substantial change to economic factors from the proposed construction activities or long-term operation of the proposed facilities would occur. Therefore, social or economic resources are not assessed further in this EA.

  Executive Order (EO) 12898 requires all Federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. Neither the Proposed Action nor Alternative 1 would have disproportionately high, adverse effects on minorities or low-income populations or communities. Consequently, this topic was dismissed from detailed analysis in this EA.

- **Air Quality –** The Clean Air Act (CAA) authorized the United States Environmental Protection Agency (USEPA) to delegate responsibility for ensuring compliance with National Ambient Air Quality Standards (NAAQS) to the states and local agencies. As such, each state develops air pollutant control programs and promulgates regulations and rules that focus on meeting NAAQS and maintaining healthy ambient air quality levels. These programs are detailed in state implementation plans that must be developed by each state or local regulatory agency and approved by USEPA. Construction and operation activities related to the observatory and cabins could impact air quality to the extent that motorized equipment would be used during construction and dust would be generated. With the implementation of Best Management Practices (BMPs) for fugitive dust, construction of this Proposed Action is expected to contribute no more than negligible impacts on air quality. There would be no emissions associated with the operation of the facilities. Accordingly, the USAF has eliminated detailed examination of air quality.

  The CAA requires that USEPA promulgate general conformity regulations. These regulations are designed to ensure that Federal actions do not impede local efforts to achieve or maintain attainment with the NAAQS. The General Conformity Rule and the promulgated regulations, found in 40 CFR Part 93, exempt certain Federal actions from conformity determinations (e.g., contaminated site cleanup and natural emergency response activities). Other Federal actions are assumed to conform if total indirect and direct project emissions are below *de minimis* levels presented in 40 CFR 93.153. A Federal action is considered regionally significant when its total emissions equal or exceed 10 percent of the

non-attainment area's emissions inventory for any criteria air pollutant. Thus with respect to the General Conformity Rule, effects on air quality would be considered major if implementation of the Proposed Action would result in a 10 percent or more increase in El Paso County's emissions, or if such emissions exceeded any *de minimis* threshold level under 40 CFR 93.153(b) for maintenance pollutants.

General Conformity under the CAA, Section 176 has been evaluated for the Proposed Action according to the requirements of 40 CFR 93, Subpart B. The requirements of this rule are not applicable to this Proposed Action because total direct and indirect emissions have been estimated and are below the applicable conformity threshold values established at 40 CFR 93.153 (b), and the Proposed Action is not considered regionally significant.

- **Water Resources –** Farish is located within the South Beaver Creek drainage. Impoundments of South Beaver Creek have formed three small lakes: Grace, Leo, and Sapphire. Depth to groundwater is greater than six feet below ground surface. Therefore, it is not expected that groundwater would be impacted during construction activities associated with the Proposed Action. In addition, construction of the new facilities would not necessitate the drilling of a well for water supply, and would therefore have no effect on groundwater resources. All proposed construction would be located within upland areas. As such, no surface or ground waters would be directly impacted by the Proposed Action.

  Threats to water quality at Farish occur indirectly from erosion and sediment transport in flows after intense rainstorms and from potential petroleum, oil, & lubricants (POL) from the maintenance facility in the floodplain of South Beaver Creek, below Grace Lake dam. Stormwater regulations are under the purview of USEPA, as the agency responsible for regulatory enforcement on Federal facilities in the state of Colorado. The General Permit for Stormwater Discharges from Construction Activities (Construction General Permit [CGP]) has the objective of preventing pollutants on construction sites (e.g., sediment, POLs) from being transported off site by stormwater runoff. The CGP is applicable to projects that disturb an area one acre or more in size, and requires that a Notice of Intent (NOI) be obtained by both the contractor doing the construction work and the owner/operator responsible for directing the work, per the definitions in the CGP. In addition to applying for an NOI, the CGP requires each project to develop and implement a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP includes BMPs for erosion and sediment control, control of waste at the site, self-inspection/monitoring, and reporting efforts.

  The General Permit for Stormwater Discharges from Federal Facility Small Municipal Separate Storm Sewer Systems (MS4) Program in Colorado provides an overall management and compliance program for the owners and operators of stormwater conveyance systems. Requirements of the MS4 program include preparation and implementation of a Stormwater Management Plan (SWMP). The SWMP identifies BMPs that address each of six minimum control measures, which include construction site stormwater runoff control and post-construction stormwater management in new development/redevelopment. The USAFA holds active permits under these USEPA stormwater programs. In addition to the USEPA permit program requirements, the USAF mandates compliance with Engineering Technical Letter (ETL) 03-01: Stormwater Construction Standards. Construction BMPs would be implemented to decrease sedimentation by erosion. Preventive BMPs could include the following:

- Limit stockpiling of materials onsite
- Manage stockpiled materials to minimize the time between delivery and use
- Cover stockpiled materials with tarps
- Install snow or silt fences around material stockpiles, stormwater drainage routes, culverts, and drains
- Install hay or fabric filters, netting, and mulching around material stockpiles, storm water drainage routes, culverts, and drains.

A minor increase in stormwater volume would result from the reduction of pervious surfaces at Farish as a consequence of constructing the facilities. The construction of eight cabins and the observatory would increase the total permanent impervious surface of the installation by approximately 4,600 square feet or approximately 1/10 of an acre. The SWPPP would provide construction and post-construction BMPs intended to control and manage the loading of sediment and other pollutants to levels that would minimize degradation of downstream water quality. Compliance with Air Force ETL 03-1: *Storm Water Construction Standards* requires implementation of BMPs to reduce site stormwater discharges and pollutant loadings to preconstruction levels or better. In compliance with the CGP, MS4 program, and ETL 03-1, the construction activities and the slight permanent increase in impervious surface area are expected to have negligible impacts on surface waters at Farish; therefore, stormwater was dismissed as an environmental issue.

- **Wetlands –** EO 11990, *Protection of Wetlands*, requires Federal agencies to avoid, where possible, adversely impacting wetlands. There are no wetlands within the proposed construction areas (see Figure 3-1). In November 2010, a wetland assessment was conducted at the proposed location of the cabins in Site 2. During the assessment, it was determined that while there was some facultative vegetation in the area, it would not be considered a wetland under either USACE or DoD criteria. Therefore, wetlands were dismissed as an environmental issue.

- **Floodplains –** EO 11988, *Floodplain Management*, requires Federal agencies to take action to reduce the risk of flood loss; minimize the impact of floods on human safety, health and welfare; and restore and preserve the natural and beneficial values served by floodplains. The Proposed Action would not be located within a floodplain area; therefore, floodplain management was dismissed as an environmental issue.

- **Cultural Resources –** The National Historic Preservation Act, as amended (16 USC 470 et seq.) and NEPA require the consideration of impacts on cultural resources listed on or eligible for listing on the National Register of Historic Places (NRHP). An archeological inventory was conducted by the University of Colorado at Colorado Springs in 1994, which provided baseline information about cultural resources at Farish. There are eight archeological sites at Farish, and three structures that are eligible for the NRHP. The USAFA does not anticipate that any historic structures or buildings or archaeological sites would be impacted by the Proposed Action. There are no known historical or archaeological resources in the sites of the Proposed Action or Alternative 1; therefore, impacts to cultural resources are not expected. Should any cultural resources be uncovered during construction of any of these facilities, work would stop and the site would be evaluated prior to the continuation of the Proposed Action. Therefore, historic structures and buildings and archeological resources were dismissed as an environmental issue.

- T**ransportation –** Farish is accessed from Colorado Springs by taking Highway 24 west from Interstate 25 for 17 miles to the town of Woodland Park and then following Rampart Range Road to Loy Creek Road and follow the signs to the entrance into Farish. The addition of the eight cabins could attract additional visitors to Farish. In addition, a bus would transport the USAFA cadets to and from the observatory. However, the slight additional volume of traffic on the regional and nearby road network would not exceed the existing capacity or reduce the existing level of service. Therefore, transportation was dismissed as an environmental issue.
- **Utilities –** Concerns regarding utilities are related to availability of necessary infrastructure to support the facility and creation of stress on existing infrastructure systems, such that they must be updated or changed. The two cabins in Site 2 would have electricity and none of the cabins in Site 5 would have electricity. The Site 2 cabins and observatory would tie in to existing nearby electrical lines. The existing electrical infrastructure has ample capacity such that the addition of these facilities would not require upgrades or stress the existing infrastructure. Therefore, utilities were dismissed as an environmental issue.
- **Threatened and Endangered Species –** No occurrence or suitable habitat for Federally listed species exists within Farish. In addition, no water depletions potentially impacting Federally protected species downstream would occur as a result of the Proposed Action.

  Several species listed by the State of Colorado as threatened, endangered or Species of Special Concern have been observed within Farish. These include bald eagle (*Haliaeetus leucocephalus*), peregrine falcon (*Falco peregrinus*), and osprey (*Pandion haliaetus*). Peregrine falcon may have habitat within the mountains surrounding Farish. Bald eagle and osprey have habitat within the Rampart Reservoir to the southeast. The proposed cabin and observatory construction and operation would have no effect on these species. Therefore, threatened and endangered species were dismissed as an environmental issue.
- **Airspace –** Because the Proposed Action would not involve any flying and/or flying missions, there would be no new impacts to airspace. Therefore, air space was dismissed as an environmental issue.

1.4 APPLICABLE REGULATORY REQUIREMENTS

This EA is documentation of the EIAP, and complies with NEPA, CEQ regulations, and DoD Instruction 4715.9. The EA addresses all applicable federal, state, and local laws and regulations, including but not limited to the Clean Air Act; Endangered Species Act; Air Force Instruction (AFI) 32-7040, *Air Quality Compliance*; EO 11990, *Protection of Wetlands*; EO 12898, *Federal Actions to Address Environmental Justice in Minority Population and Low-Income Populations*; EO 13045 *Protection of Children from Environmental Health Risks and Safety Risks*; Resource Conservation and Recovery Act; and Comprehensive Environmental, Response, Compensation, and Liability Act.

In accordance with the National Pollutant Discharge Elimination System requirements, a site-specific SWPPP, including sediment and erosion control measures, would be developed and implemented for construction activities disturbing an acre or more. An NOI would be filed to obtain coverage under the USEPA Stormwater CGP.

1.5 ORGANIZATION OF THE ENVIRONMENTAL ASSESSMENT

Pursuant to 32 CFR Part 989 implementing the CEQ regulations (40 CFR 1502), this EA consists of the following sections:

- **Acronyms** – provides a list of acronyms and abbreviations used throughout the document.
- **Section 1, Purpose and Need** – provides background information about the installation; the purpose of and need for the Proposed Action; the scope of the environmental review; applicable regulatory requirements; and a brief description of how the document is organized.
- **Section 2, Description of the Proposed Action and Alternatives** – provides the selection criteria; a detailed description of the Proposed Action, other action alternatives, and the No Action Alternative; other alternatives that were considered but not carried forward in the evaluation process; and an alternatives comparison table.
- **Section 3, Affected Environment and Environmental Consequences** – provides a description of the existing conditions of the areas potentially affected by the alternatives identified to implement the Proposed Action, and an analysis of the direct and indirect project and cumulative impacts to resources from the alternatives.
- **Section 4, Cumulative Impacts** – provides analysis of the incremental effects of the Proposed Action when added to other past, present, and reasonably foreseeable future actions.
- **Section 5, Consultation and Coordination** – provides a list of agencies/individuals to whom the EA will be distributed and the agencies/individuals who were contacted for information during the preparation of this document. A list of document preparers and contributors are also included in this section.
- **Section 6 – References.**

1.6 IDENTIFICATION OF SELECTION CRITERIA

The following is a discussion of selection criteria developed to satisfy the purpose of and need for the Proposed Action. Alternatives were developed based on how effectively they meet the selection criteria for each part of the Proposed Action.

1.6.1 Observatory and Telescope

Selection criteria for this part of the Proposed Action included the following:

1. Located in an area where a 360-degree view of the sky is available, and where the view is not obstructed by buildings, trees, mountains, or other structures.
2. Located in an area where light pollution would not interfere with telescope viewing.
3. Located in an area somewhat distant from the USAFA so that data from the new telescope could be triangulated to obtain better estimates of object locations.
4. Located such that it would not adversely impact current recreational uses at the Farish Recreation Area.

5. Designed and located such that it would not interfere with the natural character of the area (preserving background visual quality).

1.6.2 Recreational Cabins

Selection criteria for this part of the Proposed Action included the following:

1. Provides additional lodging facilities for Farish users.
2. Maintains the current recreational nature of the Farish Recreation Area.
3. Designed and located such that the cabins would not interfere with the natural character of the area (preserving background visual quality).
4. Located and designed such that the cabins would not encourage the establishment of "social" or unofficial trails for access.
5. Avoids floodplains, wetlands, and areas of high erosion potential.

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2.1 DESCRIPTION OF THE PROPOSED ACTION

The USAFA proposes to construct new facilities at the Farish Recreation Area as described below for the observatory and telescope and the recreational cabins. The specific locations of the proposed new facilities are presented on Figure 2-1. Design requirements are presented in general terms, as specific design details are subject to change. Best Management Practices would be implemented during construction to protect surrounding soils and vegetation. These measures would include, but are not limited to, the control fugitive dust and the installation of erosion control devices during construction. Noxious weed species within construction areas would be controlled before construction commences. After construction, the USAFA would continue to monitor and treat noxious weed species within Farish.

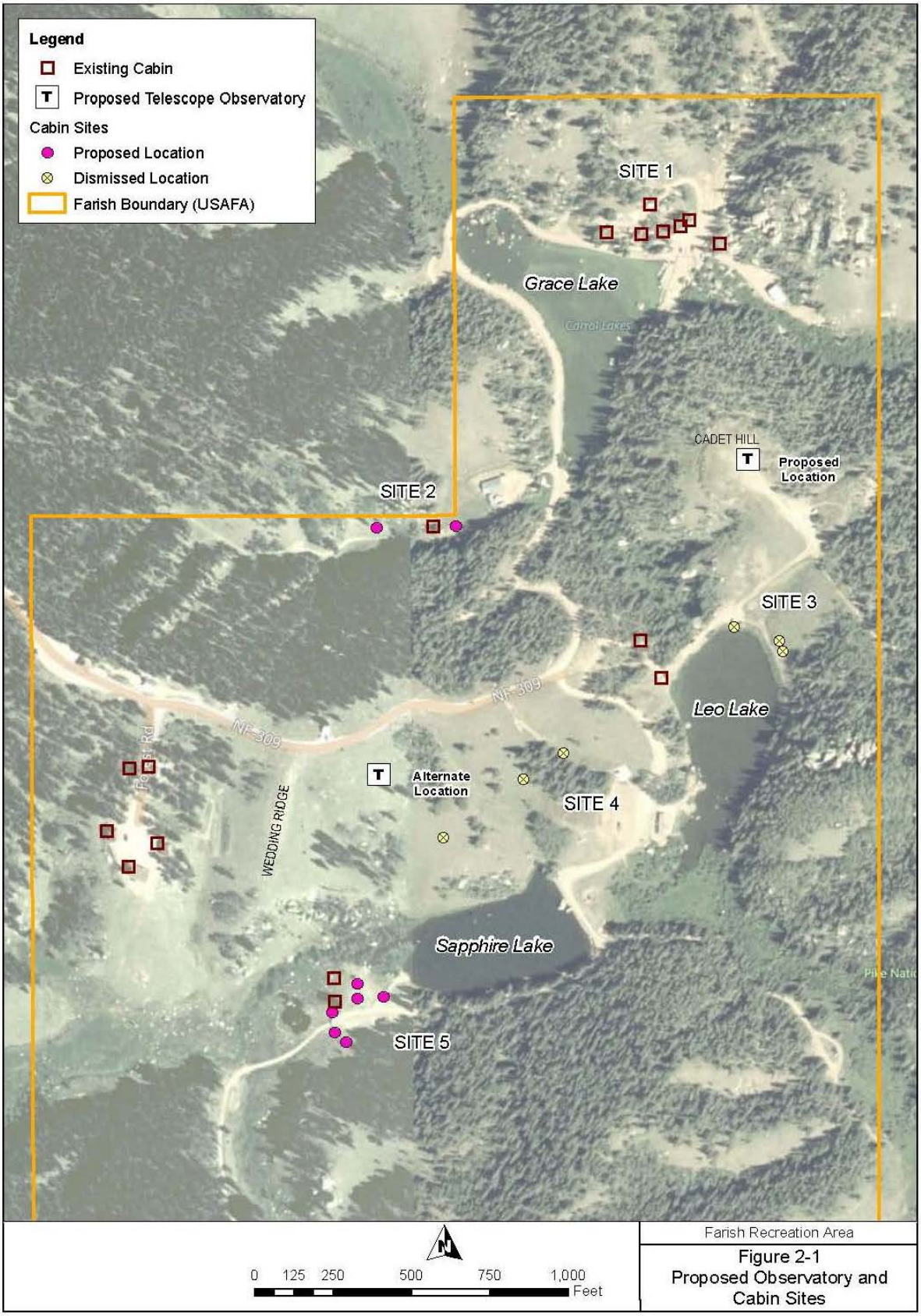
2.1.1 Observatory and Telescope

The new observatory and telescope would consist of:

- A foundation for the building built on a concrete pier, extending 3 to 4 feet into the ground.
- A domed enclosed building, approximately 10 feet in diameter and 7 to 9 feet tall, containing the telescope.
- A sunken vibration barrier for the observatory.
- A 16-inch Meade Cassegrain telescope.
- Security fencing surrounding the observatory and telescope facility.
- A graveled, unimproved parking area. This area would be approximately 35 feet by 25 feet (900 square feet) and would be designed for parking of about 8 vehicles.
- Grading and graveling of the existing road to Cadet Hill.
- An electric utility line would be installed from the bottom of Cadet Hill to the proposed observatory site.

The proposed site is located on Cadet Hill (shown on Figure 2-1), which is 550 feet north of Leo Lake and about 550 feet east of the southern end of Grace Lake, to provide 360-degree views from the telescope. The Cadet Hill site was chosen because the area is dark and ambient light would not interfere with telescope viewing; the location allows unobstructed views in all directions; and electricity is available in the area (therefore, a fuel-driven backup generator, which could interfere with the natural character of the area, would not be required). The observatory would not be located at the apex of the hill and there are tall trees that would obstruct the view between lower elevation facilities and the proposed observatory site. Therefore, although the observatory might be visible from nearby roads, it would not be visible from existing campsites.

As described in Section 1.1, Cadet Hill is also the location of an old landfill. The proposed observatory would not be constructed on top of the landfill. A delineation of the landfill would be conducted prior to the exact siting of the observatory and utility line to ensure construction of the facility would not penetrate the clay cap of the landfill. There would be a buffer distance from the delineation of the landfill to the edge of new construction. The exact dimensions of the buffer area would be determined prior to construction, and in coordination with the USAFA architectural engineers and CDPHE. This distance would be equal to or greater than the margin



Farish Recreation Area

Figure 2-1
Proposed Observatory and Cabin Sites

of error associated with the specific delineation methodology chosen. Delineation would be conducted utilizing the most appropriate method(s) available, depending on the suspected nature of buried debris present. Possible methods include: Electromagnetics using the Geonics EM-31 (EM-31), Electromagnetics using the Geonics EM-61 (EM-61), or Magnetics. These methods would be completed over a grid area centered on the proposed structure location. Geophysical data would be collected, contoured, and interpreted to ascertain any potential waste areas within the proposed construction site.

2.1.2 Recreational Cabins

The recreational cabins portion of the Proposed Action would include the construction of up to eight new cabins at two sites, as shown on Figure 2-1. Several potential sites were originally screened for general cabin locations. From these potential sites, two sites (Sites 2 and 5) were chosen as proposed cabin locations because they would avoid sensitive soils, soil erosion, and wetlands. The two proposed sites also would not restrict lake access for the general fisherman. The new cabins would be similar to the rustic cabins already existing in Farish, and would be approximately 14 feet wide by 26 feet long, with a 4-foot-wide porch. Each cabin would sleep approximately four people and would include a porch swing, cooking grill, and picnic table. Lines providing electricity to the new cabins in Site 2 would tie into existing utilities.

2.2 DESCRIPTION OF ACTION ALTERNATIVE

The Action Alternative, identified as Alternative 1, is depicted in Figure 2-1. In this alternative, the proposed new observatory and telescope would be located south of National Forest road NF-309 and east of Wedding Ridge. These facilities would be the same as those described in Sections 2.2.1 and 2.2.2; only the site location would change.

The construction and location of the eight new recreational cabins would be the same as described for the Proposed Action in Section 2.1.2.

2.3 NO ACTION ALTERNATIVE

The No Action Alternative would not satisfy the purpose of and need for the Project, but it is included in the environmental analysis to provide a baseline for comparison with the Proposed Action and is analyzed in accordance with CEQ regulations for implementing NEPA.

2.3.1 Observatory and Telescope

Under the No Action Alternative, the new observatory would not be built. USAFA cadets would not have the opportunity to observe the night sky and make measurements, or track the sun from Farish as part of the Space Situational Awareness class. Students in the CE 491 Foundation Engineering class would not have the opportunity to conduct geotechnical investigations in support of the Project, or to design the observatory building foundation and isolated concrete pier.

2.3.2 Recreational Cabins

Under the No Action Alternative, the new recreational cabins would not be built. Without additional lodging facilities at Farish Recreation Area, the number of recreational cabins would continue to be insufficient to meet the number of requests for lodging.

2.4 ALTERNATIVES CONSIDERED BUT DISMISSED

2.4.1 Observatory and Telescope

Several different locations were considered for the observatory. Sites located within the USAFA boundaries were considered but there was too much light pollution at these sites that would interfere with the telescope's viewing of the night sky. Locations within the USAFA were therefore eliminated from consideration. However, prior to the proposed construction of the new observatory at Farish, the telescope would be temporarily installed on a concrete pad at USAFA for training purposes. While the observatory was being constructed, USAFA cadets and faculty could learn how to use the telescope.

There was a consideration of an observatory within the Farish Conservation Zone, a currently undeveloped area comprising the southern portion of the Farish Recreation Area (see Figure 3-3). The Conservation Zone is a large, unrestrained natural area where views of Pikes Peak, wildlife, and wildlife habitat prevail. Man-made intrusions are minimized, and visitor use levels are low. Experiencing a sense of solitude and discovery in a natural environment are the primary outdoor recreational opportunities in this zone. This area has no existing utilities, and the introduction of the facility would present an intrusion into the tranquility of the area. Locating the telescope in the Conservation Zone would require a fuel-driven backup generator; noise from the generator would adversely impact wildlife and the visitor's sense of solitude. No existing roads currently lead to this site, so construction of an access road would be necessary. Therefore this location was eliminated from further consideration.

2.4.2 Recreational Cabins

Additional cabin locations within the several potential site areas were investigated during the development of the Project. The locations eliminated from consideration were:

- In areas with resource constraints (i.e., wetlands, floodplains, and areas highly susceptible to erosion);
- In areas not large enough to accommodate the cabin footprint;
- Near lake shores such that the cabins could potentially cut off access for fishing to the general fisherman; or
- On ridge locations with high erosion potential and with potential adverse impacts to visual resources.

2.5 COMPARISON OF ALTERNATIVES

Table 2-1 provides a comparison of the Proposed Action, Alternative 1, and the No Action Alternative as they relate to the selection criteria presented in Section 2.1.

Table 2-1
Comparison of Alternatives Against Selection Criteria

Selection Criteria	Proposed Action	Alternative 1	No Action Alternative
Observatory and Telescope			
Located in an area where a 360-degree view of the sky is available, and where the view is not obstructed by buildings, trees, mountains, or other structures	Yes	Yes	No
Located in an area where light pollution would not interfere with telescope viewing	Yes	Yes	No
Located in an area somewhat distant from the USAFA so that data from the new telescope could be triangulated to obtain better estimates of object locations	Yes	Yes	No
Located such that it would not adversely impact current recreational uses at the Farish Recreation Area	Yes	No	No
Designed and located such that it would not interfere with the natural character of the area (preserving background visual quality)	Yes	No	Yes
Recreational Cabins			
Provides additional lodging facilities for Farish Recreation Area users	Yes	N/A[1]	No
Maintains the current recreational nature of the Farish Recreation Area	Yes	N/A[1]	Yes
Designed and located such that the cabins would not interfere with the natural character of the area (preserving background visual quality)	Yes	N/A[1]	Yes
Located and designed such that the cabins would not encourage the establishment of "social" or unofficial trails for access	Yes	N/A[1]	Yes
Locations avoid floodplains, wetlands, and areas of high erosion potential	Yes	N/A[1]	Yes

Notes:
USAFA = United States Air Force Academy
[1]There is no action alternative to the Proposed Action for the Recreation Cabin construction

Table 2-2 compares the impacts to resources to be analyzed in the EA for the Proposed Action, Alternative 1, and the No Action Alternative.

Table 2-2
Comparison of Alternatives Against Resource Impacts

Resources	Proposed Action	Alternative 1	No Action Alternative
Vegetation	Construction of the new facilities would result in permanent loss of 0.11 acres of vegetation.	Impacts would be the same as the Proposed Action.	There would be no new impacts to vegetation communities.
Wildlife and Fish	No direct impacts to wildlife or fish are anticipated, with the exception of displacement or impacts to burrowing rodents from building construction.	Impacts would be the same as the Proposed Action.	There would be no new impacts to fish or wildlife.

Table 2-2
Comparison of Alternatives Against Resource Impacts

Resources	Proposed Action	Alternative 1	No Action Alternative
Geology and Soils	There would be short-term direct effects on soils from construction activities such as grading and recontouring of the soil. Long-term effects to soil would result from construction of buildings.	Impacts would be generally the same as the Proposed Action, except that the road to Cadet Hill would not be improved.	There would be no new impacts to geology or soil resources.
Land Use	The changes in land use resulting from the Proposed Action are generally consistent with the USAFA management goals for Farish.	Impacts would be the same as the Proposed Action.	There would be no new impacts to land use.
Visual Resources	There would be long-term visual impacts from the new cabins.	Visual impacts to users of Wedding Ridge would be higher than for the Proposed Action, since the new observatory would be visible.	There would be no new visual impacts.
Noise	The noise resulting from the additional visitors to Farish is not anticipated to be substantial.	Impacts would be the same as the Proposed Action.	There would be no new noise impacts.
Hazardous Materials and Waste	Because the existing landfill cap and contents would not be disturbed, no impacts with respect to hazardous materials or wastes are anticipated.	The observatory would not be constructed adjacent to the existing landfill and no impacts with respect to hazardous materials or wastes are anticipated.	There would be no new impacts from hazardous materials and waste.
Solid Waste and Pollution Prevention	Building construction and delivery of construction supplies would increase solid waste generation during the construction period for the Proposed Action. No changes to P2 initiatives or significant changes in solid waste generation would be anticipated following completion of construction as a result of the Proposed Action.	Impacts would be the same as the Proposed Action.	There would be no new impacts from solid waste and pollution prevention.

3.1 VEGETATION

Information regarding vegetation was obtained from general site observations within the extent of the proposed Project areas (study area) and from available literature. The extent of the study area includes the northern portion of Farish as shown in Figure 3-1.

A limited biological survey was conducted by URS Group on November 3, 2010. The purpose of the survey was to identify vegetation communities and assess whether wetlands were present within areas of proposed construction. During this assessment, plant species observed were recorded.

Available literature consulted included site-specific environmental reports of the Farish Recreation Area (USAFA 1996, USAFA 2008), and discussions with USAFA personnel (Mihlbachler pers comm. 2011, McCorkle pers comm. 2011).

3.1.1 Affected Environment

3.1.1.1 Vegetative Communities

The Proposed Action is located within the Crystalline Mid-Elevation Forests of Colorado (Chapman et al. 2006) at approximately 9,100 feet above mean sea level. This is an area of partially glaciated, low mountain ridges, slopes, and outwash fans. Elevationally, the Proposed Action is located within the Southern Rocky Mountain montane zone, which extends from approximately 7,000 feet to 9,000 feet in elevation at this latitude.

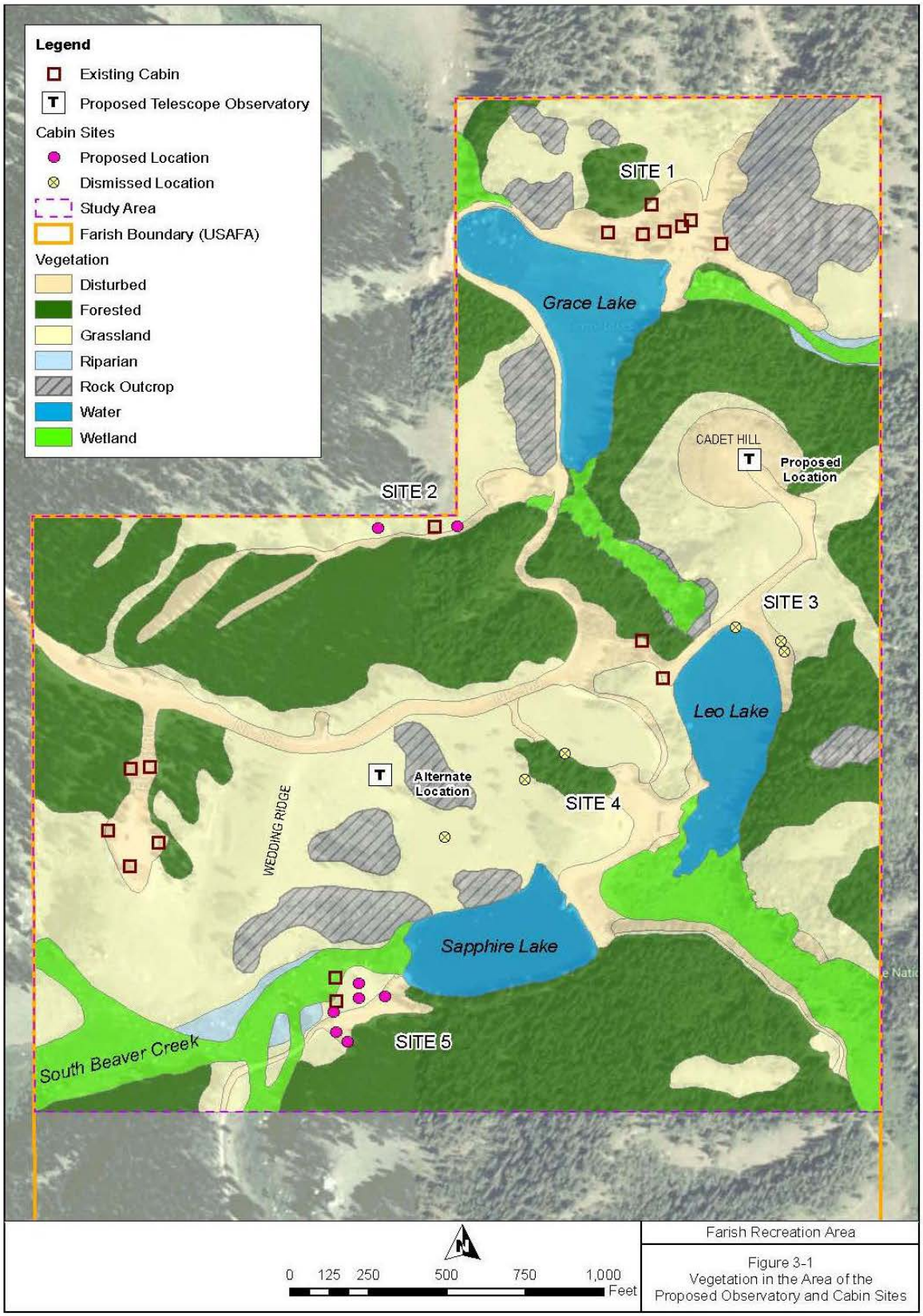
The dominant vegetative community within the montane zone is mixed conifer forest. Open meadow occurs only where historically cleared or due to wildfire. Due to extremes in terrain, riparian and wetland areas are generally confined within drainage bottoms. Fens may be present within the upper elevations of the montane zone.

Five general vegetative communities occur within the Project study area. These include montane forest, montane grassland, wetland/riparian/water, disturbed, and rock outcrop.

Montane Forest

Montane forest comprises approximately 34 percent of the study area. Montane forests within the study area are a mix of Ponderosa pine (*Pinus ponderosa*), limber pine (*Pinus flexilis*), lodgepole pine (*Pinus contorta*), and Engelmann spruce (*Picea engelmannii*) in dry areas. Douglas-fir (*Pseudotsuga menziessii*) is generally found on moderately moist slopes that have northern or western aspects. The forest edge may include stands of aspen (*Populus tremuloides*).

In some areas, dense canopies of forest have suppressed understory production. In others, shrubs such as mountain mahogany (*Cercocarpus betuloides*), kinnikinnik (*Arctostaphylos uva-ursi*), and wax currant (*Ribes cereum*) occur within the understory or openings along with forbs such as wild strawberry (*Frageria vesca*), yellow sedum (*Amerosedum lanceolatum*), upright blue beardtongue (*Penstemon virgatus*), sulphurflower (*Eriogonum umbellatum*), and wild geranium (*Geranium caespitosum*).


Legend
Existing Cabin
Proposed Telescope Observatory
Cabin Sites
Proposed Location
Dismissed Location
Study Area
Farish Boundary (USAFA)
Vegetation
Disturbed
Forested
Grassland
Riparian
Rock Outcrop
Water
Wetland
SITE 1
Grace Lake
CADET HILL
Proposed Location
SITE 2
SITE 3
Leo Lake
Alternate Location
SITE 4
WEDDING RIDGE
Sapphire Lake
SITE 5
South Beaver Creek
0 125 250 500 750 1,000
Feet
Farish Recreation Area
Figure 3-1
Vegetation in the Area of the
Proposed Observatory and Cabin Sites

Few pure stands of aspen are present within Farish, with most being late seral communities surrounding rock outcrops and forest edges. Aspens are experiencing decline and mortality with little recruitment of aspen observed, primarily due to herbivory by elk (Mihlbachler pers comm. 2011).

Wildfires have been suppressed across much of the landscape in and around Farish, resulting in fairly uniform closed-canopy coniferous forests. Ranching and agriculture early in the last century created open areas inside Farish, and the resultant heterogeneity represents historic natural conditions more so than do the vegetation patterns in the surrounding areas (USAFA 1996). However, much of the montane forest community within Farish is overstocked (USAFA 2008) and considerable mortality exists within many of the forest stands in the study area. Causes of decline include beetle and dwarf mistletoe (*Arceuthobium* spp.) infestation, and drought stress. El Paso County fire bans are enforced within Farish. The USAFA has instituted thinning operations to mitigate fire dangers (Strohm pers comm. 2011).

Montane Grassland

Montane grassland occurs in approximately 30 percent of the study area. Montane grassland is comprised of a mix of xeric montane grasses and forb species, with approximately 5 to 10 percent of scattered low growing shrubs such as shrubby potentilla (*Potentilla fruticosa*). Dominant grasses include Arizona fescue (*Festuca arizonica*), Parry's oatgrass (*Danthonia parryi*), and mountain muhly (*Muhlenbergia montana*). Dominant forbs include white sagebrush (*Artemisia ludoviciana*), fringed sage (*Artemisia frigida*), common sandwort (*Artemesia campestris*), yarrow (*Achillea lanulosa*), hairy false goldenaster (*Heterotheca villosa*), and purple locoweed (*Oxytropis lamberti*).

Primarily due to loose soils, grassland cover ranges from 90 percent to less than 50 percent. In some areas, grassland cover is 60 percent barren and comprised of single bunchgrasses and low growing forbs such as pussytoes (*Antennaria* sp.).

Wetland/Riparian/Water

Wetland and riparian areas are concentrated in the drainageway bottoms of South Beaver Creek where manmade impoundments form Grace, Leo, and Sapphire Lakes. Wetland, riparian, and open water comprises approximately 17 percent of the study area (URS 2002). Wetlands are classified into two main groups; Palustrine Emergent (PEM) and Palustrine Scrub-Shrub (PSS) (Cowardin et al. 1979). Dominant species within PEM wetlands include blue-joint reedgrass (*Calamogrostis canadensis*), Nebraska sedge (*Carex nebrascensis*), water sedge (*Carex aquatilis*), tufted hairgrass *(Deschampsia cespitosa*), and creeping spikerush (*Eleocharis palustris*). Dominant vegetation within PSS wetlands include speckled alder (*Alnus incana*), Bebb's willow (*Salix bebbiana*), strapleaf willow (*Salix eriocephala*), and mountain willow (*Salix monticola*).

Species most commonly found within riparian areas include Wood's rose (*Rosa woodsii*), ninebark (*Physocarpus monogynus*), shrubby cinquefoil (*Potentilla fruticosa*) along with mesic willow species.

One fen occurs within the study area. Dominant species within this feature are similar to other PSS wetlands, but the area also supports sphagnum moss (*Sphagnum* spp.). Porter's false needlegrass (*Ptilagrostis porteri*), a Colorado endemic, was recorded within the fen in 1992

(ESCO Associates, Inc. 1992). Porter's false needlegrass is a small bunchgrass with a habitat restricted to hummocky fens or bogs generally above 9,000 feet. Outside of Farish, this species is known only from locations in South Park. Porter's feather grass is ranked as globally and state-imperiled (NatureServe 2010); however, the species is afforded no protection under Federal or Colorado law.

Disturbed

Disturbed vegetative communities include areas where human activities, such as excavations, roads, buildings, and disposal sites have created barren ground with little or no native vegetative growth. This community type is found on roads and within groups of cabins or other communal structures where recreation has impacted the native vegetation. Vegetation occurring in these areas is a mix of non-native and native species.

Rock Outcrops

Comprised mostly of large weathered rock, these areas are scattered along slopes throughout the study area within montane forest or grassland communities. Rock outcrops contain less than 20 percent vascular vegetation, which typically grows between rocks. Scattered aspen may occur between the large outcrops or around the edges of these features.

3.1.1.2 Invasive and Non-native Species

Executive Order 13112, Invasive Species, requires that all Federal agencies prevent the introduction of invasive species, provide for their control, and minimize the economic, ecological, and human health impacts that invasive species cause. Invasive species under EO 13112 include terrestrial plants and animals, aquatic plants and animals, and microbes.

Several non-native and Colorado Department of Agriculture listed (CDA 2009) noxious plant species occur within the montane grassland and riparian communities. These include smooth brome (*Bromus inermis*), Canada thistle (*Cirsium arvense*), musk thistle (*Carduus nutans*), and yellow toadflax (*Linaria vulgaris*). Canada thistle and yellow toadflax are also listed for suppression and containment by El Paso County. Although purple locoweed is not noxious, USAFA sprays to control it as a "good neighbor' policy within Farish (USAFA 2008).

During field assessments, yellow toadflax was recorded within Site 5 and within the observatory Proposed Action location.

3.1.2 Impacts

3.1.2.1 Vegetation Communities

Impacts to vegetation were assessed quantitatively and qualitatively and include both direct and indirect impacts. Permanent impacts were determined by calculating the overlain footprint of each facility on each vegetative type. Direct permanent impacts to vegetative communities from the Proposed Action are listed in Table 3-1 and shown on Figure 3-1.

Proposed Action

Observatory and Telescope

Under the Proposed Action, temporary impacts would occur to vegetative communities around the footprint of the observatory from activities associated with construction activities and temporary equipment storage. Temporary impacts would include loss of vegetation from grading and excavation.

After construction, USAFA would follow their Standard Specification, Section 01351 (USAFA 2003) (Specifications) to restore impacted areas.

Permanent impacts to disturbed vegetative communities from the Proposed Action include approximately 894 square feet (0.02 acre) from the footprint of the observatory and parking area.

Recreational Cabins

Site 2

A total of two new cabins would be constructed within Site 2. Temporary impacts to vegetation would be similar to those occurring from the construction of the telescope facility. Permanent impacts to vegetation would include 225.5 square feet (0.01 acre) to disturbed communities and 710.5 square feet (0.02 acre) to montane grassland.

Site 5

A total of six new cabins are proposed within Site 5. Temporary impacts to vegetation would be similar to those occurring from the construction of the observatory. Permanent impacts to vegetation would include 468.0 square feet (0.01 acre) to montane forest vegetation, 1,360.0 square feet (0.03 acre) to montane grassland vegetation, and 979.5 square feet (0.02 acre) to disturbed communities.

Table 3-1
Direct Permanent Impacts to Vegetation Communities From Construction of the Proposed Action, Alternative 1, and the No Action Alternative

Vegetation Community	Permanent Impact (square feet/acre)					
	No Action	Proposed Action, Observatory	Alternative 1, Observatory	Site 2 Cabins	Site 5 Cabins	Total
Montane Forest	0/0.0	0/0.0	0/0.0	0/0.0	468/0.01	468/0.01
Montane Grassland	0/0.0	0/0.0	894/0.02	711/0.02	1,360/0.03	2965/0.07
Wetland/Riparian/Water	0/0.0	0/0.0	0/0.0	0/0.0	0/0.0	0/0.0
Disturbed	0/0.0	894/0.02	0/0.0	225/<0.01	980/0.02	2,099/0.05
Rock outcrops	0/0.0	0/0.0	0/0.0	0/0.0	0/0.0	0/0.0
Proposed Action Total	**0/0.0**	**894/0.02**	**N/A**	**936/0.02**	**2,808/0.06**	**4,638/0.11**
Alternative 1 Total	**0/0.0**	**N/A**	**894/0.02**	**936/0.02**	**2,808/0.06**	**4,638/0.11**
No Action Total	**0/0.0**	**0/0.0**	**0/0.0**	**0/0.0**	**0/0.0**	**0/0.0**

Notes:

Sums may not equal totals because the acreage for the Observatory is presented twice (under the Proposed Action and under the Alternative).

Indirect Impacts

Indirect impacts to vegetation would include degradation to vegetation from increased soil erosion and dust during construction and use of the areas. Potential soil erosion due to increased runoff from structures could degrade existing vegetation densities downslope. Increased human pressure could degrade existing vegetation surrounding cabins and trails. In addition, construction and increased use of facilities could increase fugitive dust around roads and disturbed areas, thereby indirectly impacting surrounding vegetation.

New cabins would be located primarily within existing cabin areas on level ground where vegetation has already been disturbed.

The densities and species of noxious weed species could increase within Farish from both construction and increased human presence in the area. Noxious weeds could outcompete native plant species, especially where native cover is naturally sparse.

Due to the locations of cabins, the potential for a human-caused wildfire could primarily impact disturbed areas or montane grasslands; however, a wildfire occurring within Site 2 or Site 5 could spread to the adjacent montane forest community.

Farish has instituted a speed limit of 10 miles per hour. Low speed limits minimize degradation to roads and other disturbed areas, limiting dust and minimizing loose soils that could increase erosion potential into vegetated areas.

Alternative 1

Observatory and Telescope

Under Alternative 1, temporary impacts to vegetation would be the same as those occurring under the Proposed Action. Under Alternative 1, permanent impact would occur to 894 square feet (0.02 acre) of montane grassland.

Recreational Cabins

Under Alternative 1, temporary impacts to vegetation would be the same as those occurring under the Proposed Action.

No Action

Under the No Action alternative, existing vegetation communities in the Project area would remain relatively unchanged at the Farish Recreation Area.

3.2 WILDLIFE

This section describes the wildlife species and their habitat associations at Farish. Wildlife species and their habitats were determined using existing environmental reports of the Farish Recreation Area, Fitzgerald et al. (1994), and discussions with USAFA personnel.

3.2.1 Affected Environment

The wildlife species known to occur within Farish are described as follows:

Mammals

Mammals common to the Southern Rocky Mountain montane zone occur within Farish. Mammals inhabiting montane forest include black bear (*Ursus americanus*), mountain lion (*Felix concolor*), Abert's squirrel (*Sciurus aberti*), American marten (*Martes americana*), striped skunk (*Mephitis mephitis*), long-eared bat (*Myotis evotis*), east chipmunk (*Tamias minimus*), porcupine (*Erethiozon dorsatum*), and large ungulates such as mule deer (*Odocoileus hemionus*), and American elk (*Cervus canadensis*).

Farish lies at the northern end of elk summer concentration and production area (NDIS 2009) and the species utilizes the forested areas for calving in spring and summer. During hunting season, elk move in and out of Farish, with a resultant increase in pressure on aspen in the area (Mihlbachler pers comm. 2011).

Some mammals favor the rocky outcrops and riparian areas within Farish. These include heather vole (*Phenacomys intermedius*), rabbit (*Sylvilagus* spp.), deer mouse (*Peromyscus maniculatus*), Northern pocket gopher (*Thomomys talpoides*), muskrat (*Ondatra zibethica*), and montane shrew (*Sorex monticolus*).

Mammals such as grey fox (*Urocyon cinereoargenteus*), red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*), and coyote (*Canis latrans*) forage in various habitats, including human settlements.

The USAFA considers some wildlife to be a nuisance depending on their behavior. These include bear, fox, mice, pocket gophers, raccoons, skunks, tree squirrels, mountain lions, and bats. Occurrences of black bear have become more common at Farish over the years (USAFA 2008). Bear-proof dumpsters have been installed, but trash collection within campsites is not secure from scavenging (Mihlbachler pers comm. 2011).

No human-wildlife collisions have been reported at Farish (Mihlbachler pers comm. 2011), but all-terrain vehicle use is permitted on some roads.

Birds

Farish contains habitat for both migratory and year-round resident bird species. These include Stellar's jay (*Cyanocitta stelleri*), Western wood peewee (*Contopus sordidulus*), blue grouse **(***Dendragapus obscurus*), Townsend's warbler **(***Dendroica townsendi*), red crossbill **(***Loxia curvirostra*), wild turkey (*Meleagris gallopavo*), Townsend's solitaire (*Myadestes townsendi*), downy woodpecker (*Picoides pubescens*), Western tanager (*Piranga ludoviciana*), mountain chickadee (*Poecile gambeli*), broad-tailed hummingbird **(***Selasphorus platycercus*), and pygmy nuthatch (*Sitta pygmaea*).

Aquatic Species

The lakes within Farish have been stocked with trout since 1957 (USAFA 1996). Currently, rainbow trout are stocked. Small non-game fish species and brook trout may also be present.

3.2.2 Impacts

Proposed Action

Observatory and Telescope

Under the Proposed Action, construction would occur within a previously disturbed area and no trees would be removed. Therefore, construction of the observatory would have no direct temporary or permanent impact on larger mammals and birds. Direct permanent impact or displacement could occur to burrowing rodents from structure placement.

No direct construction impacts to aquatic species would occur as no construction would occur within aquatic features.

Indirect Impacts

Individuals and groups of cadets would be attending classes at the observatory once per week. Up to fifty-two classes are anticipated to visit the telescope on a yearly basis. These functions would occur at night and would likely involve the use of small buses or multiple vehicles. This would increase the number of vehicles within Farish, noise levels, and may increase the volume of refuse. Increased travel in and out of Farish during night hours could increase the incidence of human-wildlife collisions during those hours. The enforcement of the low speed limit (10 miles per hour) would minimize wildlife collisions.

Recreational Cabins

Site 2

Noise from construction could temporarily displace wildlife and could affect nesting birds, but construction would occur in areas where existing cabins are located and no trees would be cut. Impacts would be short-term and minor. Construction of the cabins within Site 2 would result in no direct permanent impact on larger mammals and birds. Direct permanent impact or displacement could occur to burrowing rodents from structure placement.

Site 5

Construction of the cabins within Site 2 would result in no direct permanent impact on larger mammals. The removal of trees to construct one of the cabins could displace nesting birds or tree dwelling species. However, there is ample tree habitat available for relocation. Direct permanent impact or displacement could occur to burrowing rodents from the placement of cabins in the disturbed areas.

Indirect Impacts

The construction of eight additional cabins would increase the number of available sites by approximately 30 percent overall, increasing the number of campers within the facility at any given time. Increased use of the area by campers could cause indirect impacts to wildlife including increased avoidance by wildlife.

There are currently two cabins located at the southwest edge of Sapphire Lake (Site 5). Noise and movement levels within this area could increase substantially during peak use, which may create adverse conditions for some wildlife species within that area.

The proposed cabins within Site 5 would be sited within an existing camping area and infrastructure. Use in this area has likely already displaced intolerant wildlife. Aquatic features are artificially managed for recreation purposes and stocked with species tolerant to existing conditions.

Increased human activity within Farish could facilitate wildlife habituation. Increased volumes of garbage would create additional opportunities for scavenging by wildlife species. This could habituate wildlife and their offspring, creating future wildlife problems in this or other areas.

Habituation already exists within Farish to a minor degree but aside from trash raiding, wildlife-human conflicts do not appear to be a large problem. Habituation in this context could be seen as having both beneficial and adverse impacts, depending on the species involved. Adaptation to human occupation can create an environment for many small predators and prey species to maintain existing habitat with no negative consequences. However, conditions that facilitate the increased presence of predator species such as black bear and mountain lion could have adverse impacts for both humans and wildlife.

Alternative 1

Observatory and Telescope

Under Alternative 1, construction of the observatory would have no direct temporary or permanent impact on larger mammals and birds. Direct permanent impact or displacement could occur to burrowing rodents from structure placement during construction.

No direct construction impacts to aquatic species would occur as no construction would occur within aquatic features.

Indirect impacts would be the same as for the Proposed Action.

Recreational Cabins

Construction of the cabins would be the same under Alternative 1 as for the Proposed Action.

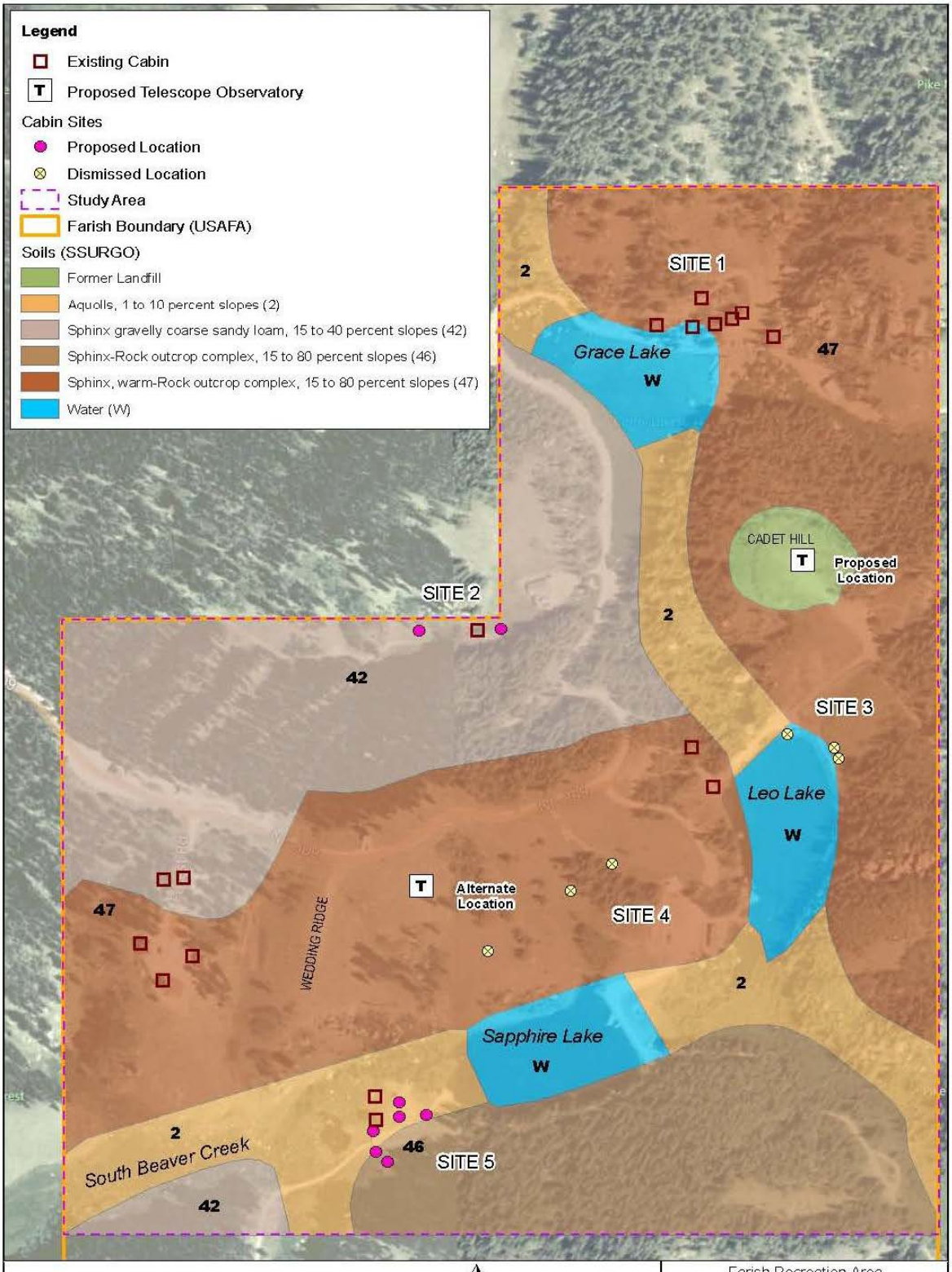
No Action

Under the No Action alternative, construction of the observatory and the new cabins would not occur and there would be no new direct or indirect impacts to wildlife or wildlife habitat. Human activity and recreational uses at Farish would continue at existing levels.

3.3 GEOLOGY AND SOILS

Characteristics of the soils in the Project area were identified and assessed within the extent of the Project study area using published soil survey data for El Paso County, Colorado (NRCS 2010). The extent of the study area includes the northern portion of Farish as shown in Figure 3-2.

To assess the impacts of the Proposed Action on soil resources, digital polygons representing individual soil types and the facility footprints were overlain on 2010 aerial photography.


Legend
Existing Cabin
Proposed Telescope Observatory
Cabin Sites
Proposed Location
Dismissed Location
Study Area
Farish Boundary (USAFA)
Soils (SSURGO)
Former Landfill
Aquolls, 1 to 10 percent slopes (2)
Sphinx gravelly coarse sandy loam, 15 to 40 percent slopes (42)
Sphinx-Rock outcrop complex, 15 to 80 percent slopes (46)
Sphinx, warm-Rock outcrop complex, 15 to 80 percent slopes (47)
Water (W)
SITE 1
SITE 2
SITE 3
SITE 4
SITE 5
Grace Lake
W
Leo Lake
W
Sapphire Lake
W
CADET HILL
T
Proposed Location
T
Alternate Location
WEDDING RIDGE
South Beaver Creek
2
42
47
46
0 125 250 500 750 1,000
Feet
Farish Recreation Area
Figure 3-2
Soils in the Area of the
Proposed Observatory and Cabin Sites

3.3.1 Affected Environment

Farish Recreation Area is located in the mountains of the Rampart Range, west of USAFA. The Rampart Range is a north-south trending uplift within the Front Range of the Rocky Mountains, extending from Platte Canyon near Denver south to Pikes Peak. The 14,110-foot Pikes Peak is approximately 15 miles south of the Farish Recreation Area (USAFA 2008). The area is underlain by Pikes Peak Granite of Precambrian age. The granite is massive, and white to orange-pink in color. Physical weathering causes the granite to disintegrate or crumble into grus, which is similar to coarse angular sand. In much of the Farish area, the granite is covered by up to 6 feet of soil and grus. At stream channels in Farish, up to 10 feet of floodplain alluvium is present, consisting of layered pebbly sand, silty clay, and clayey sand (USAFA 1995).

The soils within Farish are primarily derived from weathering Pikes Peak granite. Two major soil types occur within the Project area; Aquolls and Sphinx series soils. Aquolls are poorly drained hydric soils within the Mollisols order formed within the South Beaver Creek drainage bottom. Sphinx series soils include Sphinx gravelly course sandy loams and Sphinx rock and warm rock outcrops occurring throughout the remainder of the study area. Sphinx soils are excessively well drained soils and, due to particle size and local geomorphology, are extremely erosive. Depth to bedrock is 10 to 20 inches except within the landfill area. The depth of organic matter varies with location but is generally less than 4 inches (USAFA 2008).

Soils occurring in the landfill area and Site 5 are comprised of non-native fill soils dredged from Grace Lake (Weston 1984). Presumably, these soils were originally Aquolls although the characteristics have likely changed.

A field reconnaissance for the CE 491 Foundation Engineering Class was conducted in September 2009 and led by Dr. Karen Henry of the USAFA Department of Civil and Environmental Engineers in order to get more information about the suitability of the proposed observatory construction site. Dr. Henry concluded, based on site conditions and soil samples collected from Cadet Hill, that the location may present geotechnical challenges due to the presence of fines and non-native soils. The current soil conditions at Cadet Hill, and the variability and uncertainties associated with them, make it an unfavorable site for design. Dr. Henry recommended that, if Cadet Hill is chosen for construction, all soil that appears to be non-native to the hill top (i.e., contains significantly more fines than native soils, organic material and/or construction debris) be removed from the site prior to construction (Henry 2009).

Soil survey maps for the Project are shown on Figure 3-2. Table 3-2 lists the characteristics of each soil series.

Table 3-2
Characteristics of Soils Found Within the Observatory and Cabin Construction Project at Farish Recreation Area

Acres within Study Area	Soil Type	Taxonomy	Water Table (ft)	Available Water Capacity	Soil reaction (pH)	Surface Runoff (ksat in/hr)	Ponding	Flooding	Permeability	Hydric?	Recreational Development Potential	Shrink-Swell
2.0	Aquolls, 1 to 10 percent slope	Aquolls	0 to 2.0	Moderate (≈6.8 in)	Neutral (7.5)	0.00 to 6.02	None	Frequent	Poorly drained	Yes	Very limited	Low
3.24	Sphinx gravelly coarse sandy loam, 15 to 40 percent slopes	Sandy-skeletal, mixed, frigid, shallow Typic Ustorthents	Greater than 6 feet	Very low (≈0.9 in)	Acidic (6.2)	0.0 to 0.06	None	None	Somewhat excessively drained	No	Very limited	Low
1.77	Sphinx-Rock outcrop complex, 15 to 80 percent slopes	N/A	Greater than 6 feet	Very low (≈0.9 in)	Acidic (6.2)	0.0 to 0.06	None	None	Somewhat excessively drained	No	Very limited	Low
6.62	Sphinx, warm-Rock outcrop complex, 15 to 80 percent slopes	N/A	Greater than 6 feet	Very low (≈0.9 in)	Acidic (6.2)	0.0 to 0.06	None	None	Somewhat excessively drained	No	Very limited	Low

Source: Natural Resources Conservation Service (NRCS 2010; 2011)

Notes:

in = inches
ft = feet
hr = hour
N/A = Not Applicable
pH = potential of Hydrogen

3.3.2 Impacts

No structural movements or changes in seismicity would result from construction of the Proposed Action. Therefore, there would be negligible impacts on geology.

Impacts to soils were assessed quantitatively and qualitatively and include both direct and indirect impacts. Permanent impacts were determined by calculating the overlain footprint of each facility on each soil type. Indirect impacts include soil loss by wind and water erosion, rutting, and compaction. These impacts cannot be quantified and are discussed generally.

Proposed Action

Short-term direct effects on soils would be expected under the Proposed Action from construction activities such as grading, excavating, and recontouring of the soil. Long-term effects on soils would result from construction of buildings, including the observatory and recreational cabins.

Observatory and Telescope

Under the Proposed Action, temporary impacts would occur to soils around the observatory footprint from activities associated with construction activities and temporary equipment storage. Temporary impacts could include erosion, rutting, and impacts from temporary storage of excavated soil.

Structures would be sited on nearly level ground to minimize the potential for soil movement away from the site. USAFA would implement BMPs during construction. These measures would include, but are not limited to, dust control and the installation of erosion control devices before construction. After construction, USAFA would follow their Standard Specifications, Section 01351 (Specifications) (USAFA 2003) to restore impacted areas.

Under the preferred alternative, approximately 894 square feet (0.02 acre) of soils would be permanently impacted within the footprint of the observatory and parking area. Of this, all impacts would occur within dredged fill soils.

Recreational Cabins

Site 2

A total of two additional cabins would be constructed within Site 2. Temporary impacts to soils would be similar to those occurring from the construction of the observatory. Permanent impacts to soils would include 936 square feet (0.02 acre) to Sphinx gravelly coarse sandy loam soils within the footprint of the cabins.

Site 5

A total of six new cabins are proposed within Site 5. Temporary impacts to soils would be similar to those occurring from the construction of the observatory. Permanent impacts to soils would include 1,908 square feet (0.04 acre) to dredged fill soils and 900 square feet (0.02 acre) to Sphinx-Rock outcrop complex soils from placement of the cabins.

Indirect Impacts

Soils could become degraded from increased human pressure on the area resulting in increased soil erosion. Soils on roads with steeper grades could become eroded and rutted. Grading and maintaining the road to Cadet Hill would reduce erosion and sedimentation. All disturbed portions of the Project area will be restored per USAFA Specifications (USAFA 2003) to minimize areas of bare ground that could become degraded during use of the sites.

USAFA would monitor existing roads and trails within Farish and address areas of soil degradation. Roads within Farish have a speed limit of 10 miles per hour. This low speed limit minimizes degradation to natural substrate roads and other disturbed areas, limiting dust and minimizing loose soils that could increase erosion potential.

Alternative 1

Under Alternative 1, temporary impacts to soils would be the same as those occurring under the Proposed Action. Approximately 894 square feet (0.02 acre) of soils would be permanently impacted within the footprint of the observatory and parking area. Of this, all impacts would occur within Sphinx warm-rock outcrop soils.

No Action

Under the No Action Alternative, no new construction would occur within Farish. No impacts to soils would occur because no grading or other earth-disturbing activities would occur.

3.4 LAND USE

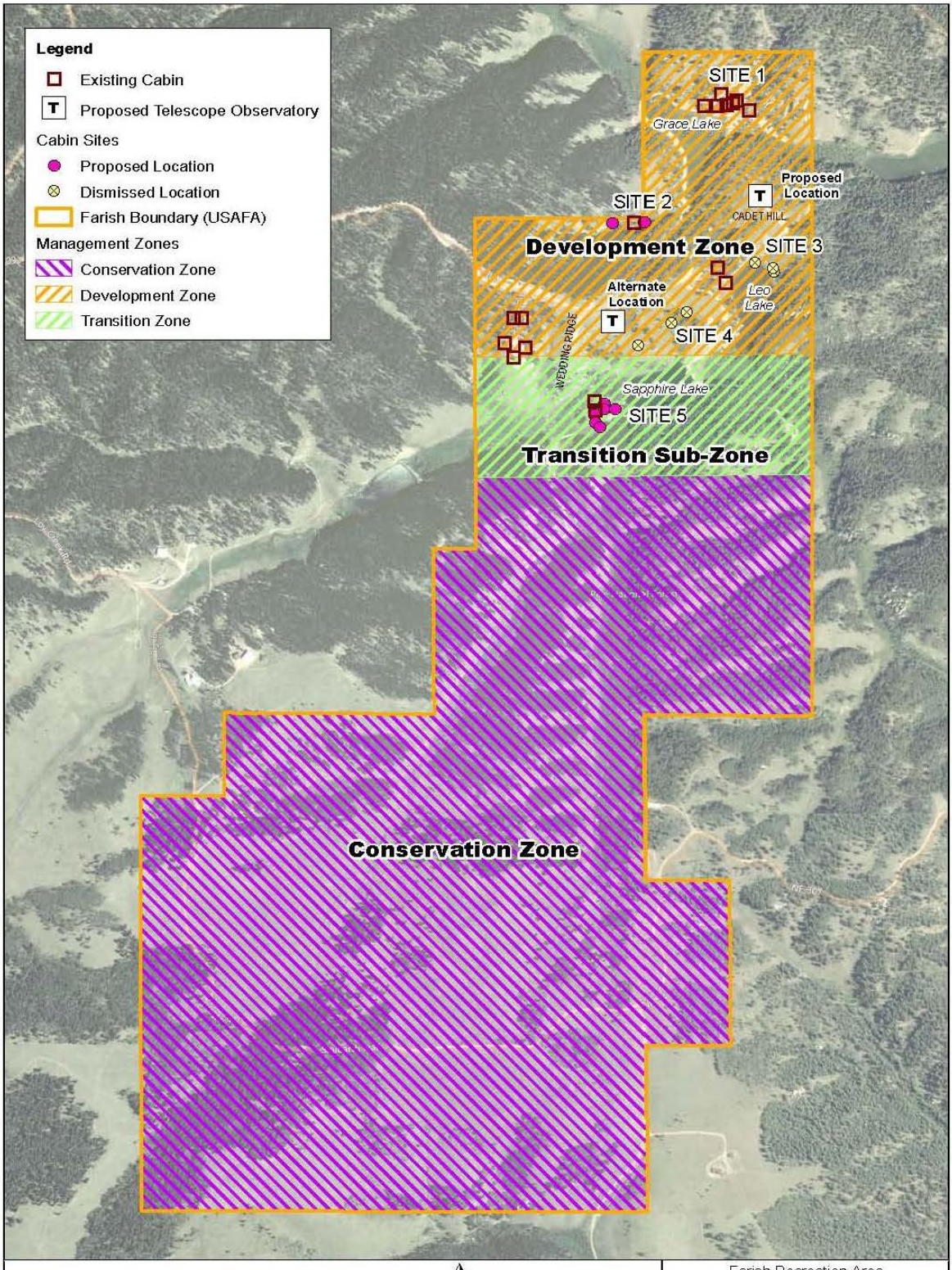
3.4.1 Affected Environment

The Farish Recreation Area is bordered on its north, northeast, northwest, and portions of its east and west boundaries by the Pike National Forest. The rest of Farish is bordered by low-density home sites and ranchettes. Private lands around Farish include a fishing resort named Carroll Lakes, ranching operations to the west, southwest, and south, and other private parcels and residences. There is one 10-acre inholding in the south-central part of Farish which is privately owned; however, the Proposed Action would be located in the northern part of Farish.

Pikes Peak, elevation 14,110 feet, is located about 15 miles south of the Farish Recreation Area. Other natural areas in the vicinity of Farish and USAFA include the Garden of the Gods Regional Park, Monument Fire Center, Rampart Reservoir Recreation Area, Mueller State Park and Black Forest Regional Park. The town of Woodland Park, population 7,200, is about 4.5 miles southwest of Farish.

The USAFA has designated three management zones for Farish Recreation Area, as illustrated on Figure 3-3:

- **Conservation Zone –** This zone is a large, unrestrained natural area where views of Pikes Peak, wildlife and wildlife habitat prevail. Man-made intrusions are minimized, and visitor use levels are low. The primary outdoor recreational opportunities in the Conservation Zone are experiencing a sense of solitude and discovery in a natural environment.


Legend
Existing Cabin
Proposed Telescope Observatory
Cabin Sites
Proposed Location
Dismissed Location
Farish Boundary (USAFA)
Management Zones
Conservation Zone
Development Zone
Transition Zone
SITE 1
Grace Lake
Proposed Location
CADET HILL
SITE 2
Development Zone
SITE 3
Alternate Location
Leo Lake
SITE 4
WEDDING RIDGE
Sapphire Lake
SITE 5
Transition Sub-Zone
Conservation Zone
0 250 500 1,000 1,500 2,000
Feet
Farish Recreation Area
Figure 3-3
Farish Recreation Area
Management Zones

- **Development Zone –** This zone is set aside for camping, lodging, and day use activities such as fishing. Human activity is evident but harmonious with the natural environment. The area is managed as a natural setting with the objective of maintaining a rural setting to minimize visitor and development impacts to the environment.
- **Transition Sub-Zone –** This sub-zone is located between the Development Zone to the north and the Conservation Zone to the south. It serves as buffer between the two zones and offers less developed recreational activities. The Transition Sub-Zone is managed between a roaded-natural and a semi-primitive motorized recreational environment.

The proposed site for the observatory and telescope is known as Cadet Hill. Cadet Hill is accessed by an unpaved road which crosses the Leo Lake dam and then climbs a steep grade to the top of the hill. The large flat area is often used as an overnight camp for military training. As described in Section 1.1, Cadet Hill was formed by material dredged from the three Farish lakes and was used as a landfill for trash from 1959 to 1960 and again from 1968 to 1971. The landfill was then closed and subsequent investigations determined that the site does not pose a risk to human health or the environment.

The alternative site for the observatory and telescope would be located southwest of the proposed site, north of Sapphire Lake, on top of a hill directly east of Wedding Ridge. This site is currently undisturbed.

The eight proposed new recreational cabins would be located at two sites, Site 2 and Site 5, as shown on Figure 2-1. Both sites are accessed by existing unpaved roads. There are currently two existing rustic cabins at Site 5.

3.4.2 Impacts

3.4.2.1 Proposed Action

The land proposed for the construction of the observatory under the Proposed Action would be converted from undeveloped land to developed land. However, Cadet Hill is currently being used by cadets for occasional nighttime activities as an overnight camp, a use which is similar to the occasional nighttime usage planned for the observatory.

Under the Proposed Action (and under Alternative 1), the observatory would be located in the Development Zone at Farish. The use of this area for educational activities would be consistent with USAFA's management goals for the future use of the Development Zone.

Construction of the new cabins would result in the conversion of undeveloped land to developed land. The two cabins at Site 2 would be located within the Development Zone, and the six cabins at Site 5 would be in the northern part of the Transition Zone. The use of land for recreational cabins is consistent with USAFA's management goals for the future use of the Development Zone and the Transition Zone.

3.4.2.2 Alternative 1

Under Alternative 1, the observatory would also be located within the Development Zone. The use of this area for educational activities would be consistent with the USAFA's management goals for the future use of the Development Zone at Farish.

The cabin construction would be the same as under the Proposed Action.

3.4.2.3 No Action Alternative

Under the No Action Alternative, the new observatory and new recreational cabins would not be constructed. These sites would remain undeveloped and there would be no impact to land use at the Farish Recreational Area in the foreseeable future.

3.5 VISUAL RESOURCES

3.5.1 Affected Environment

As described in the USAFA Final Integrated Natural Resources Management Plan/EA (USAFA 2008), the existing visual quality at Farish Recreation Area is marked by excellent views of Pikes Peak to the southwest from every ridge or high point on the property. Topographic and vegetative diversity are high. The absence of nearby development and associated nighttime light allow for excellent viewing of the night sky.

While the views from Farish are excellent, the quality of some near and middle-ground views at Farish have been lessened by the presence of road scars, parking areas, existing campsites and cabins near lakeshores, and maintenance yards. The locations of these features may have been previously chosen without regard to visual quality

3.5.2 Impacts

Proposed Action

Construction of the observatory building at the proposed location on Cadet Hill would result in a permanent visual impact. However, the observatory would not be located at the apex of the hill and there are tall trees that would obstruct the view between the existing campsites and the proposed site above. Therefore, although the observatory might be visible from nearby roads, it would not be visible from existing campsites.

Construction of the cabins would also result in permanent visual impacts created by the new buildings. The sites for the proposed new cabins would not interfere with views from the shores of the Farish Lakes, although some of the new cabins at Site 5 could be visible from Sapphire Lake. The new cabins would be visually similar to the rustic cabins already existing in the Farish Recreation Area.

Alternative 1

Under Alternative 1, the observatory would be located approximately 250 feet east of Wedding Ridge. Matrimony Point on Wedding Ridge is a popular spot for outdoor weddings and is

known for its striking views of Pikes Peak to the southwest. The observatory and its new access road would be visible to the northeast from Wedding Ridge and would result in an impact to the visual resources at this location.

Impacts from construction of the cabins in Alternative 1 would be the same as the Proposed Action.

No Action

Under the No Action Alternative, visual resources at Farish Recreation Area would be unaffected.

3.6 NOISE

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air, and are sensed by the human ear. Sound is generally characterized by several variables, including frequency and intensity. Frequency describes the sound's pitch and is measured in hertz (Hz), whereas intensity describes the sound's loudness and is measured in decibels (dB). Decibels are measured using a logarithmic scale. A sound level of 0 dB is approximately the threshold of human hearing and barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above about 120 dB begin to be felt inside the human ear as discomfort and eventually as pain at still higher levels.

Noise is considered to be unwanted sound that diminishes the quality of the environment or interferes with normal activities. Nighttime sounds may be perceived as more disturbing to humans and wildlife than during the day.

Some land uses are considered sensitive to noise. They often include residential dwellings, temporary housing facilities such as mobile homes or hotels, hospitals, nursing homes, educational facilities, parks, and libraries. Industrial, commercial, and agricultural land uses are generally not considered sensitive to noise.

3.6.1 Affected Environment

The Farish Recreation Area provides an off-base, high-quality, natural, mountain outdoor recreation setting for the DoD community. The level of noise at Farish is lower than at the Academy and would generally be typical of a park or other natural recreational area.

3.6.2 Impacts

Proposed Action

Construction of the observatory under the Proposed Action would result in a short-term increase in daytime sound levels during the construction period. Construction activities at the observatory would include grading of the building site, the parking area, and the road from Leo Lake dam, in addition to construction of the observatory building. The USEPA published data on average sound levels for typical construction phases for industrial facilities (USEPA 1971). Table 3-3 shows average sound levels for typical construction phases.

Table 3-3
Typical Sound Levels for Construction

Construction Phase	Sound Level (L_{eq}) at 50 Feet from Source
Site Clearance	90
Excavation	89
Pile Driving	95
Foundations	78
Erection	85
Finishing	89

Source: USEPA 1971.
Note:
L_{eq} = Equivalent Sound Level

Once the construction of the proposed observatory and cabins had been completed, sound levels would be much lower but still higher than before construction. Individuals and groups of cadets would be attending classes at the observatory. Additional traffic and use of the observatory would result in some additional noise, mostly occurring at night. Up to approximately 52 classes are expected to visit the telescope on a yearly basis. This would increase the number of vehicles on the roads, and noise levels within Farish. The eight new cabins would sleep an additional four persons each, resulting in up to an additional 32 persons per day at Farish Recreational Area. Because Farish can currently accommodate over 200 visitors at its multiple lodging and day-use facilities, the incremental additional noise resulting from up to 32 additional visitors would not be anticipated to be substantial.

Alternative 1

Impacts from noise from construction of the observatory at the Alternative 1 location and noise from the recreational cabins would be similar to the Proposed Action.

No Action Alternative

Under the No Action Alternative, the observatory and new cabins would not be constructed. This alternative would have no effect on noise at Farish Recreation Area.

3.7 HAZARDOUS MATERIALS AND WASTE

This section discusses hazardous materials and waste issues at Farish related to construction activities under the Proposed Action or action alternatives. This discussion includes asbestos-containing materials (ACMs), lead-based paint (LBP), and polychlorinated biphenyls (PCBs). Solid waste and pollution prevention are addressed in Section 3.8.

Under the Proposed Action, the observatory would be constructed of new materials on Cadet Hill. As described in Section 1.1, Cadet Hill is believed to be primarily composed of the material dredged during the excavation of Leo and Grace Lakes. It is also an old landfill that operated from 1959 to 1960 and again from 1968 to 1971. The material disposed at the landfill was all trash generated at Farish, including paint and paint thinner, and reportedly one drum of

sodium arsenate. Although the exact nature of the landfill debris is unknown, the Farish landfill has been adequately characterized and does not pose a risk to human health or the environment. No soil contamination was detected, and the water quantity and quality investigation around the landfill indicate that the landfill poses a minimal threat to human health. In January 1997, a NFADD was submitted to CDPHE with a recommendation of NFRAP. In December 1998, the NFADD was approved by CDPHE. The document detailed the investigations that had occurred at this site and concurred with the USAF recommendation of NFRAP. In summary, the Farish Landfill has been adequately characterized, and it does not pose a risk to human health or the environment.

There are two locations at Farish which have been identified as areas where dredged sediments from the lakes were dumped. The use of copper sulfate and sodium arsenic for aquatic vegetation and pest control presents concerns for contamination in the dredged material. One location appears to be on the NF-309 road and would not be located near any proposed construction. The second location appears in an expansion area of Sapphire Lake and would not be located near any proposed construction (Weston 1984).

3.7.1 Affected Environment

Asbestos-Containing Materials

The former landfill was in operation from 1959 to 1960 and again from 1968 to 1971. Buildings and structures constructed prior to 1980 are assumed to most likely have been constructed using ACMs. Because the incidence of ACMs at the USAFA is prevalent, it can be assumed that some ACMs are contained within the Cadet Hill landfill.

Friable ACM or ACM that may be rendered friable as the result of disturbance must be abated in accordance with Colorado Regulation No. 8 (5 *Code of Colorado Regulation* [CCR] 1001-10) and Occupational Safety and Health Administration (OSHA) regulations, as applicable. Given that the landfill has a clay cap, there is a remote possibility that asbestos-contaminated soil may be encountered during construction of the observatory foundation and vibration barrier. Prior to any asbestos-contaminated soil and ACM disturbance, notification must be made to the CDPHE, and an agency-approval management plan be developed.

Reporting and management of disturbed asbestos-contaminated soil and ACM in soil is regulated under either (1) Regulation No. 8, Part B, or (2) Regulations Pertaining to Solid Waste Disposal Sites and Facilities, 6 CCR 1007-2, Section 5. If the disturbed asbestos is part of a facility component (as defined by Regulation No. 8, Part B as "any part of a facility including equipment") and the total quantity of material exceeds the trigger levels of 260 linear feet on pipes or 160 square-feet on other surfaces, or the volume to be removed is greater than the volume equivalent to a 55-gallon drum, then Regulation No. 8, Part B would apply.

Lead-based Paint

In 1978, DoD implemented a ban on the use of LBP. The operational period of the landfill suggests that at least some of the materials contained within the landfill would potentially contain LBP. Areas determined to contain LBP have health and safety concerns associated with performing activities that could disturb aged or peeling paints including cutting, torching, demolition, or other forms of disturbance.

Polychlorinated Biphenyls

PCBs are a class of man-made compounds that were manufactured and used extensively in electrical equipment such as transformers and capacitors, paints, printing inks, paper, pesticides, hydraulic fluids, lubricants, synthetic rubber, plasticizers, floor tile, brake linings, adhesives, fluorescent light ballasts, and asphalt, to name a few. PCBs have been demonstrated to cause cancer and other serious non-cancer health effects in animals, including effects on the immune system, reproductive system, nervous system, and endocrine system.

In 1979, USEPA began phasing out most PCB uses under 40 CFR Part 761. Because the landfill predates this ban, it is possible that some of the contents items could still contain PCBs.

3.7.2 Impacts

Proposed Action

As described in Section 2.1.1, a delineation of the landfill within Cadet Hill would be performed prior to construction of the observatory. The observatory would then be designed to be located adjacent to the existing landfill. The landfill cap and contents would remain undisturbed from current conditions. Accordingly, no impacts would be expected with respect to hazardous materials or wastes.

Given the historical use of the site, however, if the landfill cap was inadvertently penetrated during construction of the observatory, workers could be exposed to ACMs, asbestos-contaminated soil, LBP, or PCBs. Should the cap be inadvertently penetrated during construction, the USAF would ensure compliance with all applicable Colorado, USEPA, and OSHA requirements to reduce the potential adverse health effects associated with exposure to asbestos, lead, or PCBs and ensure protection of the environment.

There would be no potential effects associated with construction of the recreational cabins.

Alternative 1

Under Alternative 1, the observatory and telescope would be located southwest of the proposed site, north of Sapphire Lake, on top of a hill directly east of Wedding Ridge. There would be no impacts to human health from ACM, LBP, or PCBs.

Impacts from ACM, LBP, and PCBs from construction of the recreational cabins would be similar to the Proposed Action.

No Action

Under the No Action alternative, construction of the observatory and recreational cabins would not occur and there would be no impacts to human health from disturbing ACM, LBP and PCBs.

3.8 SOLID WASTE AND POLLUTION PREVENTION

The USAF Pollution Prevention Program (P2 Program) encompasses a range of environmental management functions, including recycling, hazardous/toxic chemicals reduction, green (environmentally friendly) procurement, and waste minimization. The USAF Solid Waste Program deals specifically with the management and reduction of solid waste streams. Both of

these programs may affect nearly every aspect of operations at the USAFA. Contractors at USAF installations provide a variety of services, including operation of recreational facilities such as Farish. Contractor tasks are established in written contracts and special clauses require contractors to participate in the various elements of the P2 Program.

Each installation is required to have a Qualified Recycling Program (QRP), and all facilities at an installation must participate in the QRP. Under the QRP, readily accessible containers should be provided at work areas, to include construction and recreational facilities, as appropriate, for the accumulation of the following recyclables: copier paper, plastic, metals, glass, used oil, lead acid batteries, cardboard, newspaper, and tires. A recycling contractor empties recycling containers on a regular schedule and recycles the collected materials.

Reduction of hazardous material use at USAF installations is normally achieved through the implementation of a hazardous materials pharmacy (HAZMART), a centralized location for inventory, control, and distribution of hazardous materials to authorized shops and contractors. Reduction efforts focus on the "EPA 17" industrial toxics, seventeen compounds prioritized by USEPA for reduction due to particularly high associated environmental and human health hazards. Various initiatives are used to reduce use, including control of use through the chemical authorization process, limits on quantities distributed, and substitution of non-hazardous products.

Green Procurement is the USAF initiative established to comply with Federal Green Procurement requirements. Green procurement seeks to direct USAF purchasing power toward the procurement of high recycled-content goods, from copier paper to construction materials.

3.8.1 Affected Environment

The USAF P2 and Solid Waste Programs facilitate the reduction of solid waste (both hazardous and non-hazardous) through adjustments to the behaviors and work practices of installation personnel. The P2 and Solid Waste Management Programs administered at the USAFA would also affect operations at any new facilities constructed at Farish. New facilities would be required to participate in the USAF P2 and solid waste management activities to reduce solid waste.

3.8.2 Impacts

Proposed Action

Building construction and delivery of construction supplies would temporarily increase solid waste generation (e.g., concrete and building materials). Certain forms of construction-related solid waste might be eligible for diversion to recycling. Contractors would be required to purchase chemicals through the HAZMART. Construction contractors should attempt to recycle waste materials for which a market exists, procure recycled-content materials whenever feasible per USAF Green Procurement requirements, minimize the use of hazardous materials during construction, and remove any unused hazardous and non-hazardous wastes at the conclusion of project performance.

Because the Proposed Action is limited to the addition of an observatory and telescope and eight recreational cabins with little or no change to existing personnel and operations, no significant

changes to P2 initiatives or solid waste generation would be anticipated following completion of construction as a result of the Proposed Action.

Alternative 1

Impacts from Alternative 1 would be the same as the Proposed Action.

No Action

If the No Action Alternative is implemented, solid waste generation at USAFA would not increase. USAFA P2 and solid waste management would be unaffected.

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4.1 CUMULATIVE EFFECTS

A cumulative effect is an incremental effect of an action when added to other past, present, and reasonably foreseeable future actions. Cumulative effects can be individually minor, but collectively significant from actions taking place locally or regionally over a period of time.

U.S. Census Bureau data indicate that the population in the nearby community of Woodland Park has increased over the last 10 years, from 6,515 residents in 2000 to 7,200 residents in 2010. An increase in the population of Woodland Park could result in upgrades to the transportation network in the region and increased human presence in the Farish area.

According to the *Integrated Natural Resources Management Plan/ Environmental Assessment*, USAFA plans various improvement projects for the Farish Recreation Area. These projects would include improvement of campground sites, and addition of recreational vehicle sites and camper cabins. These projects would provide additional lodging for the military users of Farish Recreation Area. However, these projects could also potentially impact the natural resources of the area and could result in a cumulative impact to the overall recreational experience at Farish.

In addition, there is a proposal to reconstruct the embankment of Leo Lake. Leo Lake is situated between Sapphire Lake (the highest elevation lake in Farish) and Grace Lake (the lowest elevation lake in Farish). Because the Leo Lake embankment is greater than 10 feet in height, the dam is classified by the Colorado Division of Water Resources (CDWR) as "Jurisdictional". Initially constructed in the 1930s, the embankment does not meet current standards regarding slopes, spillway design, and outlet works. As an alternative to the reconstruction of the embankment, there is a proposal to abandon the reservoir. The abandonment would involve the draining of the reservoir, construction of a pipe to carry water from Sapphire Lake to Grace Lake and restoration/revegetation of the drained reservoir area.

The anticipated cumulative effect of these projects is provided in Table 4-1.

Table 4-1
Cumulative Impacts on Resources Analyzed in Detail

Resource	Past Actions	Current Background Activities	Proposed Actions	Known Future Actions	Cumulative Effects
Vegetation	Past development at Farish has resulted in the loss and degradation of native vegetation.	USAFA currently monitors and treats noxious weed species within Farish.	The construction of new facilities would contribute to the cumulative losses and degradation of vegetation communities.	The construction of new facilities would contribute to losses and degradation of vegetation communities. USAFA's program for monitoring and treatment of noxious weeds would continue.	The construction of new facilities at Farish would contribute to the cumulative losses and degradation of vegetation communities.

Table 4-1
Cumulative Impacts on Resources Analyzed in Detail

Resource	Past Actions	Current Background Activities	Proposed Actions	Known Future Actions	Cumulative Effects
Wildlife and Fish	Use of Farish by campers and other recreationists has likely caused indirect impacts to wildlife including increased avoidance by wildlife.	Wildlife are important resources and are protected and managed as part of the recreational experience at Farish.	The Proposed Action is not anticipated to result in substantial impacts to wildlife.	The planned improvements to campground sites, addition of recreational vehicle (RV) sites and camper cabins could result in some loss of wildlife habitat and vegetation communities and increased human presence at Farish. Abandonment of Leo Lake would reduce fish habitat in the area.	Increased use of the area by campers could cause indirect impacts to wildlife including increased avoidance by wildlife and increased habituation. Then number of human-wildlife vehicle collisions could increase.
Geology and Soils	Past Farish development has modified soils.	None.	Grading and soil recontouring would result in further soil disturbance.	Continued maintenance and improvements at the Farish would locally impact soils.	Additional development at Farish would result in permanent but localized impacts to soils.
Land Use	Farish has been managed as a recreational facility for military users since its inception.	None.	Lands currently categorized as open space or natural would be converted to new recreational facilities; however the facilities would be consistent with management goals for land use.	Lands currently categorized as open space or natural would be converted to new recreational facilities; however conversions would be consistent with management goals for land use.	Lands currently categorized as open space or natural would be converted to new recreational facilities. Management goals for land use would not change.
Visual Resources	Past development has lessened the visual quality of some near and middle-ground views at Farish.	New development is sited to protect the existing excellent visual quality of the Farish Recreation Area.	The new facilities have been designed to lessen potential impacts to Farish visual resources.	New facilities would be designed to be consistent with the rustic nature at Farish and to lessen potential impacts to visual resources. Visitors would readily notice the abandonment of Leo Lake, restoration/ revegetation of the area would lessen this visual impact.	Additional development at Farish would result in incremental lessening of the visual quality of near and middle-ground views at Farish.

Table 4-1
Cumulative Impacts on Resources Analyzed in Detail

Resource	Past Actions	Current Background Activities	Proposed Actions	Known Future Actions	Cumulative Effects
Noise	Use of Farish as a recreational facility has resulted in some additional noise.	Background noise levels at Farish are typical of those found at other natural recreational areas.	Substantial noise impacts are not expected from the Proposed Action.	The planned improvements to campground sites, addition of RV sites and camper cabins would not result in substantial increases in noise.	Noise levels at Farish would increase as additional development brings more human visitors to the recreational area.
Hazardous Materials and Waste	ACM, LBP, and PCBs were widely utilized for building construction. Development of the USAFA incurred generation of hazardous materials and wastes.	The USAFA is working toward becoming PCB free. ACM and LBP are no longer used in building construction.	No impacts from ACM, LBP, and PCBs are expected.	Continued development and maintenance of Farish would incur generation of hazardous materials and wastes.	Impacts would be cumulatively negligible effect because all hazardous materials and wastes generated during Proposed Action implementation would be used and disposed of according to all applicable regulations.
Solid Waste and Pollution Prevention	Solid waste was created during previous development in Farish.	The USAF P2 and Solid Waste Programs facilitate the reduction of solid waste.	No major changes to P2 initiatives or solid waste generation are anticipated following construction activities.	New facilities would be required to participate in the same USAF P2 and solid waste management activities as similar existing facilities.	New facilities would be required to participate in the same USAF P2 and solid waste management activities as similar existing facilities.

4.2 UNAVOIDABLE ADVERSE IMPACTS

Unavoidable adverse impacts would result from implementation of the Proposed Action. None of these impacts would be significant.

Geology and Soil Resources – Under the Proposed Action and Alternative 1, construction activities, such as grading, excavating, and recontouring of the soil, would result in soil disturbance. Implementation of BMPs during construction would limit potential effects resulting from construction activities. Standard erosion-control means would also reduce potential impacts related to these characteristics. Although unavoidable, impacts on soils are not considered significant.

Hazardous Materials and Wastes – The use of hazardous materials and generation of hazardous wastes are unavoidable conditions associated with the Project. However, the anticipated short term increase in the use of hazardous materials and generation of hazardous wastes would not be substantially higher than current usage and generation and, therefore, is not considered significant.

4.3 COMPATIBILITY OF THE PROPOSED ACTION AND ALTERNATIVES WITH THE OBJECTIVES OF FEDERAL, REGIONAL, STATE, AND LOCAL LAND USE PLANS, POLICIES, AND CONTROLS

Impacts on the ground surface as a result of the Proposed Action would occur entirely within the boundaries of the Farish Recreation Area. Construction of the new facilities would not result in any incompatible land uses. The proposed locations of the facilities were selected according to existing land uses. Consequently, construction of the new observatory and the new recreational cabins would not conflict with USAF land use policies or objectives. The Project would not conflict with any applicable off-installation land use ordinances.

4.4 RELATIONSHIP BETWEEN THE SHORT-TERM USE OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

Short-term uses of the biophysical components of the human environment include direct construction-related disturbances and direct impacts associated with an increase in population and activity that occurs over a period of less than 5 years. Long-term uses of the human environment include those impacts that occur over a period of more than 5 years, including permanent resource loss.

Several kinds of activities could result in short-term resource uses that compromise long-term productivity. Filling of wetlands or loss of other especially important habitats and consumptive use of high-quality water at nonrenewable rates are examples of actions that affect long-term productivity.

The Project would not result in any intensification of land use at Farish and in the surrounding area. Therefore, it is anticipated that the Project would not result in any cumulative land use or aesthetic impacts. Long-term productivity of this site would be increased by the introduction of the observatory for educational use and cabins for recreational use.

4.5 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The irreversible environmental changes that would result from implementation of the Proposed Action or Alternative 1 involve the consumption of material, energy, land, biological, and human resources. The use of these resources is considered to be permanent. Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that use of these resources would have on future generations. Irreversible effects primarily result from use or destruction of a specific resource that cannot be replaced within a reasonable time frame (e.g., energy and minerals). Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the Project.

Material Resources – Material resources irretrievably utilized for the Project would include building materials (for construction of the facility), and various material supplies (for infrastructure). Such materials are not in short supply, would not limit other unrelated construction activities, and their irretrievable use would not be considered significant.

Energy Resources – Energy resources utilized for the Project would be irreversibly lost. These include petroleum-based products (such as gasoline and diesel), natural gas, and electricity. During construction, gasoline and diesel would be used for the operation of construction

vehicles. During operation, gasoline would be used for the operation of private and government-owned vehicles. Natural gas and electricity would be used by operational activities. Consumption of these energy resources would not place a significant demand on their availability in the region. Therefore, no significant impacts would be expected.

Biological Resources – The Project would result in minimal, irretrievable loss of vegetation and wildlife habitat on proposed cabin construction sites. Total permanent loss of vegetation and associated wildlife habitat would be less than 0.1 acre and would not be considered significant.

Human Resources – The use of human resources for construction and operation is considered an irretrievable loss, only in that it would preclude such personnel from engaging in other work activities. However, the use of human resources for the Project would represent educational opportunities for USAFA cadets and employment opportunities for other workers, and is considered beneficial.

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5.1 LIST OF PREPARERS

This EA has been prepared under the direction of DoD and the USAFA. The individuals who contributed to the preparation of this document are listed below.

URS Group

Susan Hall
Senior Ecologist
B.S. Environmental Science
Years of Experience: 7

Amal Hijazi
Environmental Compliance Specialist
M.S. Environmental Sciences
Years of Experience: 18

Pam McWharter
Senior NEPA Specialist
B.S. Microbiology
Years of Experience: 18

Joseph Rigley
GIS Specialist
B.S. Rangeland Resource Science
Years of experience: 13

Catherine Storey
Senior Environmental Scientist
B.S. Chemistry
Years of experience: 24

USAFA

Brian Bush, Attorney-Advisor, USAFA JA

Jennifer Hewett, Community Planner, 10 CES/CECP

Jennifer McCorkle, NEPA Compliance Program Manager, 10 CES/CECP

Brian Mihlbachler, Natural Resources, 10 CES/CEAN

Diane Strohm, Natural Resource Planner, 10 CES/CEAN

Vicki Williams, Comprehensive Planning and Cultural Resources Manager, 10 CES/CECP

Bob Zboralski, Farish Recreation Area Manager, 10 FSS/FSCF

5.2 PUBLIC INVOLVEMENT AND AGENCY CONSULTATION

AFI 32-7060, *Interagency and Intergovernmental Coordination for Environmental Planning* streamlines current Intergovernmental Coordination for Environmental Planning (IICEP). It identifies federal regional interagency and state intergovernmental roles of the USAF Regional Compliance Offices. It also identifies intergovernmental planning coordination at local and area wide levels as the major commands (MAJCOMs) provide guidance to their installations. Through the IICEP process, concerned federal, state, and local agencies must be notified and allowed sufficient time to evaluate potential environmental impacts of a Proposed Action.

For the Farish Recreation Area Observatory and Cabin Construction EA, public involvement, agency consultation, and government-to-government relations have been conducted in accordance with AFI 32-7061, NEPA and its associated CEQ regulations, and other applicable laws and regulations. The public comment period provides opportunities for government agencies, interest groups, and the public to express concerns regarding analyses conducted for the Draft EA.

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